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S. Hrg. 103-179

PENDING INDOOR AIR QUALITY AND RADON ABATEMENT LEGISLATION

Y 4.P 96/10:S.HRG.103-179

Pending Indoor Air Quality and Rado...

ARING

EFORE THE

SUBCOMMITTEE ON
CLEAN AIR AND NUCLEAR REGULATION
OF THE

COMMITTEE ON
ENVIRONMENT AND PUBLIC WORKS
UNITED STATES SENATE

ONE HUNDRED THIRD CONGRESS

FIRST SESSION

ON

S. 656

A BILL TO PROVIDE FOR INDOOR AIR POLLUTION ABATEMENT, INCLUDING INDOOR RADON ABATEMENT, AND FOR OTHER PURPOSES

AND

S. 657

A BILL TO REAUTHORIZE THE INDOOR RADON ABATEMENT ACT OF 1988, AND FOR OTHER PURPOSES

MAY 25, 1993

Printed for the use of the Committee on Environment and Public Works

OCT 25 1993

U.S. GOVERNMENT PRINTING OFFICE
68-493 WASHINGTON : 1993

For sale by the U.S. Government Printing Office
Superintendent of Documents, Congressional Sales Office, Washington, DC 20402
ISBN 0-16-041422-9

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PENDING INDOOR AIR QUALITY AND RADON ABATEMENT LEGISLATION

TUESDAY, MAY 25, 1993

U.S. SENATE,
COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS,
SUBCOMMITTEE ON CLEAN AIR AND NUCLEAR REGULATION,
Washington, DC.

The committee met, pursuant to notice, at 10:05 a.m. in room 406, Dirksen Senate Office Building, Hon. Joseph I. Lieberman [chairman of the subcommittee] presiding.

Present: Senators Lieberman, Lautenberg, and Faircloth.

OPENING STATEMENT OF HON. JOSEPH I. LIEBERMAN, U.S. SENATOR FROM THE STATE OF CONNECTICUT

Senator LIEBERMAN. Good morning and welcome to this hearing of the subcommittee on Clean Air and Nuclear Regulation.

I am delighted to convene this hearing which will consider legislation that has been authored by three of the environmental leaders of the United States Senate, our majority leader, George Mitchell, the ranking member of this committee, John Chafee, and my colleague from New Jersey, Frank Lautenberg.

Congressman Kennedy, welcome. There is a fourth environmental leader. I invite you to come right to the table. We will impose upon your normal tolerance and respect for the Senate and force you to listen to a few statements, then we look forward to your statement.

[Laughter.]

Senator LIEBERMAN. I am delighted to be an original cosponsor with the colleagues I have mentioned of the indoor air and radon legislation. Both of these bills have passed the Senate by very wide margins in previous Congresses. I believe that with the support of the new Administration this will be the Congress in which these good ideas are enacted into law.

I also want to more formally extend my appreciation to Congressman Kennedy for his hard work and leadership on the indoor air legislation and for being willing to come over and spend some time testifying today.

In this time of scarce resources, both public and private, the American people want assurances that new laws that we adopt will address our most pressing problems. Of course, we in Congress share that concern. As we all know, the American people are also deeply concerned about the high cost of health care. The legislation before us today responds to both of those public concerns. It addresses two of the most serious environmental health risks facing our Nation today and it will reduce our country's medical bill.

EPA estimates that the cost to society from these threats, including medical costs, increased sick leave, and reduced productivity, are in the tens of billions of dollars per year. The good news is that most of those costs can be prevented.

EPA and its Science Advisory Board in comparative risk studies have consistently ranked indoor air pollution, including radon, as one of the four top environmental risks to the health of the American people. A report that was released just yesterday by the Center for Resource Economics pointed out that EPA spends only a small portion of its budget on some of its most dangerous pollution problems, and one of those is indoor radon. In Health People 2000, the Nation's health strategy, the Department of Health and Human Services identified increased radon testing as one of the three top environmental health goals for the Nation.

Testifying before this committee, a former assistant surgeon general, Vernon Houk, said that the evidence of the health threat posed by radon is the strongest of any environmental contaminant.

EPA estimates that between 7,000 and 30,000 lung cancer deaths in the United States each year are attributed to radon. It is in fact the Nation's second leading cause of lung cancer, surpassed only by smoking. EPA's risk estimate for radon is based on extensive occupational human data, including studies of thousands of underground miners. It is also supported by animal studies. A 1990 National Academy of Sciences study supports EPA's approach to measuring the risk from radon.

Another indoor air pollutant, tobacco smoke, causes 3,000 lung cancer deaths in non-smokers each year and impairs the respiratory health of hundreds of thousands of children. A selected group of other indoor contaminants causes several thousand additional cancers each year.

Health effects from indoor air pollution include eye, nose, and throat irritation, respiratory effects, neurotoxicity, kidney and liver effects, heart functions, allergic and infectious diseases, developmental effects, and immunogenicity. Illnesses caused by indoor air contaminants take their toll in death, suffering, and discomfort.

We are not just talking about theory here. We are talking about some very serious health consequences for people in this country.

When people think of air pollution, the problem is that they too often think of smokestacks belching fumes that turn blue skies into grey. But Americans spend about 90 percent of our time indoors these days. Pollutants exist indoors at levels two to five times higher than the outdoor levels.

The bills we are considering today are a measured response to those deadly, serious problems. The radon legislation will ensure that EPA and the States will continue to address the health threats posed by radon. The requirement in the radon bill for testing in schools is particularly important because the Nation's children are a special concern, and special here because of their smaller size and higher breathing rates, which makes them more susceptible to damage from these indoor air pollutants.

I am going to yield, at this point, to my colleague and one of the original cosponsors of this legislation, Senator Frank Lautenberg.

OPENING STATEMENT OF HON. FRANK R. LAUTENBERG, U.S. SENATOR FROM THE STATE OF NEW JERSEY

Senator LAUTENBERG. Thank you, Mr. Chairman.

I commend you for holding this hearing. I am pleased to welcome Congressman Kennedy here. He is a very strong supporter of the environment.

At the risk of repeating some things the chairman said, I am going to focus on this legislation and express my strong support for the Indoor Radon Abatement Reauthorization Act and the Indoor Air Quality Act.

These bills address the serious health threats posed by radon and other indoor air contaminants. I have a particularly close touch, unfortunately, with the radon problem. One is that a New Jersey resident was first detected as he walked through a scanning device as having had a radioactive propensity of very high proportions. It turned out that was the result of exposure to radon gas in New Jersey. We have a whole neighborhood that has been devastated by the presence of radon gas and a very costly program has begun the mitigation, but it has disrupted the life of the community significantly.

We would like to get this issue resolved, if possible. EPA and its Science Advisory Board both have consistently ranked radon and other indoor air pollutants as among the top environmental risks to human health. The Department of Health and Human Services, in its publication, Healthy People 2000, the Nation's health strategy, identified increased radon testing as one of just three environmental health goals for the Nation.

The subcommittee which I chaired in the last two Congresses had jurisdiction over both of these important bills. I was Floor manager when the Senate approved them.

As sponsor of S. 657, the Indoor Radon Abatement Reauthorization Act, I am convinced that it would make important progress in addressing a pervasive and serious health threat.

At a Superfund Subcommittee hearing in 1989, Assistant Surgeon General Vernon Houk said that the evidence of the health threat posed by radon is the strongest of any environmental contaminant. The evidence that the assistant surgeon general had referred to involves lung cancer deaths to miners caused by radon. I think that was the initial discovery of the peril of radon present.

In 1991, the National Academy of Sciences report on radon concluded that this mine data can be used to estimate the risks in our home and schools from radon exposure. Based on this report, EPA estimates that radon causes 14,000—the number jumps around slightly, but there is no doubt about the fact that there is a very significant number of cancer deaths every year as a result of exposure to radon. That makes radon the second leading cause of lung cancer, behind smoking as we heard from the chairman's statement earlier.

As early as 1988, EPA and the Surgeon General's Office issued a national health advisory urging people to test their homes. I took a trip to Sweden to see how they deal with radon gas exposure, and they do it very, very well at a fairly low cost of mitigation. The houses, when they are built, recognize the fact that there is some risk from radon gas exposure and they deal with it by ventilation. Very simple.

Earlier this year, EPA released its survey of radon in schools which showed that nearly one in five schools across the United States had at least one room with radon levels above the EPA radon level. Fortunately, it is a relatively inexpensive test to test for and to mitigate elevated levels of radon.

Mr. Chairman, S. 657 reauthorizes programs established in the 1988 Indoor Radon Authorization Act, or IRAA, which Senator Mitchell authored, and IRAA requires EPA to provide grants and technical assistance to States to initiate radon programs, establish a voluntary testing proficiency program, conduct a national survey of radon in schools, establish model radon construction standards, and establish a regional radon training center.

The bill also includes three key provisions. First, it would increase radon information dissemination efforts, including requiring that radon information be distributed to home purchasers prior to the completion of a real estate transaction. Second, it requires testing of schools in radon-prone areas. Radon grants to States are available to assist in the cost of testing. And finally, it fosters the use of radon construction standards in radon-prone areas.

I look forward to hearing the comments of our witnesses. I particularly want to welcome Dr. Jill Lipoti, who is Assistant Director for Radon Radiation Programs in the New Jersey Department of Environmental Protection and Energy. We had the benefit of Dr. Lipoti's testimony on radon in 1990 before. She brings a welcome insight in how best to address the radon problem and I look forward to hearing her testimony.

Mr. Chairman, I thank you for the opportunity to participate in the hearing this morning.

Senator LIEBERMAN. Thank you, Senator.

Now Congressman Kennedy, thank you for coming over. We look forward to your testimony.

STATEMENT OF HON. JOSEPH P. KENNEDY, II, A REPRESENTATIVE IN CONGRESS FROM THE COMMONWEALTH OF MASSACHUSETTS

Mr. KENNEDY. Thank you very much, Mr. Chairman and Senator Lautenberg. I appreciate your interest and steady support for this legislation over the years.

I really also want to thank Senator Mitchell for the tremendous work he has done on this issue on the Senate side. I wish we had as much clout on the House side in terms of the interest level in indoor air quality.

I think both of your opening statements were right on the target in terms of the health threat of radon, but it isn't just radon. The fact is that there are a whole range of chemicals that we breathe in each and every day in this country in our homes and in our places of business that can be potentially toxic for the human body. If you take a deep breath, the fact is that right here in this room you will probably be breathing in things like formaldehyde, benzine, all sorts of germs, bacteria—I don't know if I should get you guys a gas mask.

But the fact is that on the House side I took our own ventilation system apart in my office, a system that hadn't been cleaned in many, many years. The kind of growth of different funguses and other contaminants that are contained in ordinary working buildings, in some of the nicest buildings in New York and New Jersey and Connecticut and Massachusetts that will look absolutely fantastic from the outside, if you bother to go up and look at the guts of the building, in many cases those are the maintenance programs that are ignored.

You can find that the ventilation systems themselves haven't been cleaned for years. As a result, the chemical contamination continues to build up.

I used to work right here in a building in downtown Washington, D.C. and I noticed that it was very difficult—that people seemed to have their heads down and were extremely tired. A lot of people would say that what they really needed to do was go outside and take a walk to get a breath of fresh air. So I used to go upstairs to the top of the building, and I found that the building owner felt that—obviously in the wintertime he would have to heat his building and in the summertime he would have to air condition the building—he would save a lot of money by simply shutting down all the clean air intakes on the roof of the building.

As a result, you continuously breathe the same air time and time again. With the energy management techniques that are available in this country today, we find that building owners can save money by basically sealing the building. As a result, you have very little clean air coming into the building.

I think we have a potentially serious health threat that the EPA, our Government, and most businesses, and certainly the people of America really have no understanding of.

As you pointed out in your testimony, Mr. Chairman, the fact is that the EPA, while it ranks indoor air as one of the five most important health risks to the American people, the reality is that we spend tens of billions of dollars cleaning up outdoor air, we spend tens of billions of dollars cleaning up hazardous waste sites, but Bill Reilly, when he was EPA Administrator, said that for the number one health threat to this country we spend just a couple hundred million dollars.

The fact is that Americans spend 90 percent of their time indoors. We simply don't know what reasonable levels of these various chemical contaminants might be in terms of the toxicity levels for the human being.

So the first portion of the Indoor Air Quality Act sets to determine what those standards might be. We need to inform the American people of unseen dangers in the air we breathe every day. The bill contains two main purposes. The first goal of the bill is to improve our knowledge about the causes and effects of indoor air pollution and their health effects. The bill would also find solutions to reduce indoor air pollution.

EPA would establish a coordinated and comprehensive Federal research, development, and demonstration program to improve indoor air quality. It also requires a national assessment of schools and child care facilities to determine the seriousness and scope of indoor air problems.

Radon alone is an enormous problem in our Nation's schools. A recent EPA study of 1,000 schools showed that one out of ever five require some mitigation. Nationwide, EPA estimates that over 70,000 school rooms may have excess radon levels, yet radon is but one of the numerous indoor air contaminants with which we must contend.

More and more, we are coming to realize the extent to which schools are plagued with indoor air problems. In fact, concerned teachers and parents and students of the Cambridge School, the largest high school in my district, initially brought this issue to my attention. The problems in schools only represent a fraction, albeit an important fraction, of our far-reaching national problem.

I should mention that when Cambridge parents, teachers, and students came to my office and complained that literally the kids had to be carried out of the school, the teachers finally came because they were so concerned about the problems they faced, they could not find an office within the Federal Government to call and ask for a test to be done on the quality of the indoor air.

Finally, after my office looked into it to a great extent, we found an indoor air quality office at EPA. It didn't have any staffers and didn't have any responsibility for going out to the field and making testing programs. We finally hired a small little company in Boston to come out and test the air. They found that what was really going on was that the school buses were pulling up and dropping kids off right where the clean air intake of the building was. So all the exhaust from the school buses was going up inside the air intakes.

But it is those kinds of problems that we need to be able to address that someone, when they feel the quality of the air they are breathing, they need to be able to call somebody in the Government and have them come out and test it. We ought to establish a baseline for what in fact are the toxicity levels that we should expect human beings to be able to be exposed to.

This bill has been controversial in the past because at some points we have said that the buildings around our country ought to at least, as a bare minimum, meet the standards that were in place when the buildings were built. Even that has a hard time getting through.

We looked at what happens when new carpeting is laid out. Many of us, if you have walked into a building, you can smell the glue that comes from new carpeting in the building. Yet, if you start to do anything on carpeting, you find that you get a lot of people who get upset about it. There are a lot of people with carpeting manufacturers in their districts, and the like. So you run into some resistance.

But if in fact this is a major health threat to the American people, and if in fact we can find ways of spending literally tens of billions of dollars cleaning up outdoor air, and yet the solution to indoor air is to go outside and take a walk, then it would seem to me to only be logical that we would begin to investigate the scope of the problem, that we would incentive in a very small way businesses to come up with ways of mitigating—as Senator Lautenberg pointed out, in Europe, some of the ways you can mitigate against indoor air quality is simply by providing new clean air into the space.

That doesn't always work, but there are mitigating techniques that we ought to be investigating and providing to those that feel that there is a problem. If there is a difficulty, we ought to allow people to call the Government and have them come in and check. If you are cold in our State, Senator, in the middle of winter, you can call up your local town or city hall and have them come and check the thermostat to make sure that you're not living in a dangerous circumstance. You cannot do that for the quality of the air that we're breathing.

It seems to me that if we're going to spend the resources of this Government looking out after the environmental hazards that we as a Nation are facing, that looking out after them inside the space that we live and walk and breathe and work in 90 percent of our time is a base minimum standard that we ought to be able to accept.

I want to again thank the Senate, in particular, for the hard work that it has done on this issue. As I said, we need some help over in the House side where this bill has been referred to three committees. We have faced difficulties in the past.

But I should say that Carol Browner has been a strong advocate of clean indoor air. And with the renewed interest of this Administration, I think we have a friend and someone who will advocate effectively for us in the House of Representatives.

I want to again thank you for the opportunity to testify before you. I would be happy to answer any questions and work with you in the coming months.

Senator LIEBERMAN. Thank you very much, Congressman Kennedy. You have stated the case very well in all ways, both the anecdotal evidence that you gave and the overall impact of this problem on society and the feasibility of doing something about it.

Let me just reassure you that these bills are priorities not just for the subcommittee but for the Senate Democratic leadership. Clearly, Senator Mitchell, as an original cosponsor, wants to see them move.

Our hope is that after this hearing we will mark these two bills up expeditiously and get them out to the floor as soon as possible. We then look forward to working with you to see if we can follow a multi-front strategy in the House and extract the appropriate bills from those three committees. We will join with you in making sure that this is the session of Congress in which we finally do something about cleaning up the indoor air.

Mr. KENNEDY. I absolutely pledge to work with you. I think that Henry Waxman has indicated that he is ready to move on this bill. We just need to make sure that John Dingell sees the light and a few other folks over there.

Senator LIEBERMAN. Our feeling was that we would take care of Henry if you would take care of John.

[Laughter.]

Mr. KENNEDY. No problem. I have always been able to take care of him.

[Laughter.]

Senator LIEBERMAN. We will do the heat if you will do the light.

[Laughter.]

Senator LAUTENBERG. I would say that it is no surprise to see Congressman Kennedy following in the footsteps of our friend, Senator Ted Kennedy, who is always on the cutting edge of issues affecting health. He works very hard at them. I am not at all surprised that you are taking the leadership role that you have.

One of the problems that we have with indoor radon is the fact that it is invisible, odorless, not really apparent in very obvious ways, and as a consequence people tend to get a little complacent about it and don't understand that if you look at it there is a very serious threat to health—children, in particular—as a result of poor indoor air quality and radon.

You see it particularly in closed space, like an airplane, where the airline in order to cut down on the cost for ventilating will often shut down the outside air intake. Consequently, the air in airplanes is as foul as you can get.

I am the author, on this side of the Capitol, of the no smoking legislation in airplanes. The savings in health costs, as well as operating costs to the airlines—because they have increased maintenance due to the accumulated dirt and whatever else in their ventilating systems—the same is true with buildings. The advantage to being able to deal with smoking was the fact that it is so obviously distasteful that people respond very vigorously.

I think as a result of the legislation that we put through to eliminate smoking on airplanes, we began a role for health in the country. People became aware of how nice it is without cigarette smoke or without smoke hanging over your head. As a consequence of better air quality in airplanes with the elimination of smoking, people now begin to complain if people are smoking in line ahead of you or in restaurants or in larger buildings. Cigarette smoke just runs out and grabs you.

Indoor air quality, radon, doesn't have the same direct effects, but it has the same indirect effects. It is next only to cigarette smoking in terms of lung danger.

So we ought to get on with it and not to permit this legislation to languish as it did before. If we can enlist the help of our friends on the House side—and I think we can—and with your leadership, Congressman Kennedy, I believe it will happen. We just have to stick together and work hard on it.

Mr. KENNEDY. If I might add just one quick thought, as both of you have stated, the radon threat is very serious. There is this larger issue which you both have been out in front of for years along with Senator Mitchell. I think there would be some effort to try to carve out the radon piece and leave the other health threats to the American people hanging.

I would just hope that we could try to keep all of the points that are contained in the Senate bill intact as we push in the House of Representatives as well.

Senator LIEBERMAN. That is a very important point. I agree with you totally because the radon is only a part of the broader problem.

We have a witness here today, Nancy Alderman from North Haven, Connecticut, who is going to testify to problems she had with indoor air pollution in her car. We have done hearings in the past about carpets that you referred to. So this is a very broad consequential health problem.

These are two very balanced moderate bills. It is time to get them done.

Joe, thanks for coming over.

Mr. KENNEDY. Thank you very much, Mr. Chairman.

Senator LIEBERMAN. We will go now to our first panel, the Hon. Bob Sussman, Deputy Administrator at the EPA; accompanied by Margo T. Oge, Director of the Office of Radiation and Indoor Air.

In the meantime, I will include in the record, at the request of the majority leader, Senator Mitchell's statement in support of these two pieces of legislation. Unfortunately, his schedule, which is obviously busy, prevents him from being with us today. Also, a statement from Senator Chafee.

[The statements referred to follow:]

STATEMENT OF HON. GEORGE J. MITCHELL, U.S. SENATOR FROM THE STATE OF MAINE

Good morning Mr. Chairman, ladies and gentlemen.

Today's hearing is an important step toward enactment of legislation to protect the quality of the air indoors and reduce exposure to the most deadly indoor air contaminant—radon gas.

I want to thank Senator Lieberman for holding this hearing on the Indoor Air Quality Act, which I introduced, and Senator Lautenberg's Radon Abatement Act, which I have cosponsored. I also want to thank Senator Chafee for his strong support for both bills and his constructive contributions to this effort.

Enactment of these bills will protect public health and help reduce rates of lung disease for all Americans.

The evidence of the serious health effects of indoor air pollution is compelling. The Environmental Protection Agency has concluded that "exposure to indoor air pollution poses a significant threat to the domestic population." Radon gas alone is estimated to cause between 5,000 and 30,000 lung cancer deaths each year.

I am especially concerned about reducing health risks from indoor air pollution in my home State of Maine. We have known for several years that Maine has high levels of radon gas. Thirty percent of Maine homes are thought to have unsafe levels of radon. This percentage is the eighth highest of the 42 States tested to date.

Recent studies have found high rates of lung disease in Maine. The rate of lung cancer is Maine is 23% above the national average. The rate of chronic obstructive pulmonary disease in Maine is 36% above the national average. The causes of lung disease in Maine are under study but it is likely that indoor air pollution and radon will be found to be a contributing factor.

In addition to protecting public health, the indoor air and radon bills will help reduce medical costs and improve the productivity of the workforce. The Environmental Protection Agency estimates that medical costs of indoor air pollution are over $1 billion. EPA has also concluded that indoor air pollution causes "productivity losses in the tens of billions of dollars per year".

In reviewing all costs of indoor air pollution, EPA stated "it is reasonable to conclude that the aggregate costs of indoor air pollution amount to tens of billions of dollars per year".

I was pleased that, in the last Congress, the Senate passed both indoor air and radon legislation by overwhelming margins—88–7 in the case of indoor air and 82–6 in the case of radon.

Unfortunately, despite the clear evidence of the tragic health consequences of indoor air pollution and the huge costs to society in terms of medical costs and lost productivity, the previous administration opposed both bills and they were not enacted. I hope that this Congress will be different. I hope that the Administration will indicate its support for both indoor air and radon legislation in its testimony today.

In addition, I want to encourage the Administration to go beyond simply stating support for the bill and work constructively with us to revise and improve the bills and, most importantly, to make the case for prompt legislative action in the House of Representatives.

The indoor air and radon bills are an excellent opportunity to improve the health of all Americans and I look forward to working with the Chairman and other colleagues on the Committee report this legislation in the near future.

Thank you, Mr. Chairman.

STATEMENT OF HON. JOHN H. CHAFEE, U.S. SENATOR FROM THE STATE OF RHODE ISLAND

Mr. Chairman, I am pleased that we are today holding a hearing on two bills which, when enacted, will significantly improve the quality of the air we breath indoors. Both bills were approved by the Senate during the 102nd Congress by significant margins: The Indoor Air Quality Act of 1991, S. 455, was approved by the Senate on November 6, 1991 by a vote of 88 to 7. The Indoor Radon Abatement Reauthorization Acts S. 792, was passed by a vote of 82 to 6, on March 10, 1992. Neither bill was considered in a House/Senate conference.

The first bill we are considering today, the Indoor Air Quality Act for 1993, is virtually identical to the bill approved in 1991. This bill will provide for a substantial research and development initiative to uncover harmful pollutants in our indoor environment, and will focus the efforts of the Federal Government to address this problem.

By focusing our efforts on providing clean indoor air, we will make strides towards preventing health problems before they occur. Our Nation spends billions of dollars each year on health care. Many of the illnesses we experience are preventable. In terms of public health, this bill will provide us with a much needed ounce of prevention, and help us to avoid the costly pound of cure in treating respiratory illnesses.

The Second bill will take testimony on today is the Indoor Radon Abatement Reauthorization Act of 1993. This bill will ensure that the Environmental Protection Agency will continue to address the serious health threats posed by inhalation of radon gas. This legislation authorizes $15 million a year through 1996 in grants to states. This funding will enable states to continue programs to detect and abate radon in thousands of homes throughout the nation. In addition this bill will require testing in hundreds of schools and federal buildings, and require EPA to further educate the public about the dangers of radon.

Mr. President, we hear a lot of talk from EPA regarding the need to spend our limited resources on the areas which pose the most risk According to EPA and the National Academy of Sciences, radon and indoor air contaminants consistently rank high on the list of pollutants which pose a threat to human health.

Thank you again for scheduling this hearing. I look forward to a productive session.

Senator LIEBERMAN. I welcome both of you here. It is our custom to run the timing lights on a 5-minute cycle. We usually give a little bit of latitude to the representative of the agency. So if you want to go a little bit longer, you may do so, but we have a lot of witnesses so we hope to be able to move it along.

It is a pleasure to greet you personally. I have known of you and have known you for a long time. This is the first time I have had the chance to put the "Honorable" in front of your name, although you have always been honorable. I enjoy doing that.

Just to avoid controversy, I am not going to ask you where you went to law school.

[Laughter.]

Senator LIEBERMAN. Please proceed with your testimony.

STATEMENT OF HON. ROBERT M. SUSSMAN, DEPUTY ADMINISTRATOR, ENVIRONMENTAL PROTECTION AGENCY, ACCOMPANIED BY MARGO T. OGE, DIRECTOR, OFFICE OF RADIATION AND INDOOR AIR, ENVIRONMENTAL PROTECTION AGENCY

Mr. SUSSMAN. Thank you very much, Mr. Chairman.

I do want to introduce Margo Oge to the subcommittee. Margo is the Director of our Office of Radiation and Indoor Air and is responsible for our indoor air and radon programs. She is doing a very good job in both areas.

I am pleased to be here today to testify on indoor air quality and radon issues. Indoor air quality is one of the most important emerging issues on EPA's agenda. Comparative risk studies performed by the agency and its Science Advisory Board have consistently ranked indoor air pollution, including radon, above the top four environmental risks to public health.

The bills before you would positively augment existing EPA programs to address these serious risks and would enhance the effectiveness of ongoing EPA efforts to protect the public. Accordingly, EPA is strongly supportive of the two bills.

My testimony identifies a few areas where we believe that improvements in the bills may be warranted. The Administrator and I look forward to working closely with this committee to expeditiously develop legislative provisions which address these concerns and permit us to move ahead vigorously with expanded radon and indoor air pollution abatement initiatives.

I would like to speak briefly about the scope of the indoor air quality problem, which we do believe is a serious public health concern. Indoor air pollutants, which include environmental tobacco smoke, radon, and other chemical and biological contaminants, can cause long-term and short-term health effects, especially when inadequate ventilation allows indoor concentrations to increase.

EPA studies of human exposure to air pollutants indicate that indoor levels of many pollutants may be two to five times—and occasionally 100 or even 1,000 times—higher than outdoor levels. These levels of indoor air pollution are a particular concern when we keep in mind that most people spend as much as 90 percent of their time indoors.

EPA is committed to a pollution prevention approach to indoor air quality. There are several key elements to that approach. First, we are attempting to minimize exposure to all indoor air contaminants to the extent reasonable. Second, we are trying to transfer existing information to those in the Government and outside the Government who are in a position to improve indoor air quality. And third, we are pursuing research to develop sound scientific information to fill the many knowledge gaps that we have in this area.

I would like to comment briefly on the three elements of our approach.

First, the agency supports aggressive utilization of our different statutory authorities to identify specific pollutants that present direct human health risks and to use a variety of means to reduce exposure to those pollutants indoors.

Simultaneously, we are vigorously pursuing an indoor air research program. We need this program, Mr. Chairman, to improve our scientific understanding of the key factors that determine indoor air pollution health risks and the effectiveness of the various risk reduction strategies we might undertake.

Finally, we have also set a high priority on improving the way in which buildings are designed and operated. We strongly support this integrated building systems approach.

Let me turn briefly to the proposed Indoor Air Quality Act.

We support several elements of this act, which we believe will complement and strengthen ongoing EPA efforts to improve indoor air quality. First of all, this act would set in motion a significant national research program, which we believe is very much needed.

Second, it would encourage EPA to identify recommended management practices for the operation and maintenance of buildings. This is also an effort we consider important.

Third, this program would mandate enhanced information development and dissemination. Again, this is a very important step to help State and local governments as well as individual citizens who need more information on indoor air quality problems.

Fourth, this legislation would strengthen State grant programs. Again, this is a very important step.

And finally, it would improve coordination among the many agencies that are interested in and involved in improving indoor air quality.

I would now like to turn my attention to EPA's radon action program. I would like to start by emphasizing, as you did, Mr. Chairman, and as Senator Lautenberg did, the serious health risks that we believe radon presents. Radon is, as you indicated, estimated to be the Nation's second leading cause of lung cancer, behind smoking.

Estimates of the health risks from radon exposure are based on extensive occupational human data as well as animal studies. It is estimated by EPA that between 7,000 and 30,000 lung cancer deaths in the United States each year are attributable to radon.

Most provisions in S. 657 will enhance the current efforts of EPA's radon action program. Therefore, again, the agency is quite supportive of this bill. For instance, making the radon proficiency programs mandatory would increase consumer protection and improve the accuracy of measurement standards and mitigation services across the country. The continuation of the State indoor radon grants program would help States sustain awareness and further reduce the public's risk of radon exposure.

Universal information disclosure and the option to include a radon testing contingency in real estate contracts is necessary to increase awareness of radon hazards, and also very significantly to increase testing for radon as part of real estate transfers.

For all these reasons, we support the radon bill before this committee and look forward to working with you to markup this legislation.

I would like to add a few brief comments on resource concerns because they are important not only to the agency, but to the Congress.

Mr. Chairman, we do estimate that both of these bills will require EPA to dedicate additional resources for the implementation of our indoor air program as well as our radon program. In fiscal year 1994, if this legislation is passed, we will of necessity have to reprogram some existing resources in order to meet the new statutory goals. As we move into the fiscal year 1995 budget, it will be appropriate to consider additional funding.

I want to stress this point because we at EPA, as you know, have much on our plate. We have many competing priorities. Certainly radon and indoor air are important, but we will need some help to implement these bills in accordance with your intent and make sure that we are adequately implementing the other programs that we are mandated to administer. I did want to stress the resource issues presented by these bills in the hope that we can work cooperatively to address them.

In conclusion, I want to emphasize that Administrator Browner and I support these bills and will remain steadfast in our desire to work with this committee to ensure that the indoor air quality of our Nation is improved to the extent that it should be.

This concludes my testimony. I am pleased to be here, and would be very happy to answer any questions.

Senator LIEBERMAN. Thank you very much, Mr. Sussman.

We are going to run the 5-minute clock on ourselves as well.

Before going to my questions, let me try to put a punctuation point after your testimony because sometimes things happen here that we miss.

I appreciate your testimony. We have never before in the history of these two pieces of legislation had an Administration support them. So what you have done here today on behalf of Administrator Browner and indeed on behalf of President Clinton is significant. I hate to overuse the word, but it is historic. It is a piece of history in the environmental movement. I personally appreciate it and obviously it gives us considerably more hope—the House notwithstanding—that we have had before that we can actually take these two good ideas and turn them into a law that will protect the public health of the American people.

I thank you.

Mr. SUSSMAN. It is our pleasure, Mr. Chairman.

Senator LIEBERMAN. Thank you.

Let me begin the questioning on the nature of the risk because implicit in the discussions that have been occurring and the report that was out yesterday is whether the Congress, as a political body sometimes reacts to public concerns about the environment that may not be as scientifically based as we would like and don't react in other cases where the science is pretty hard.

I want to focus here on this because there has been some criticism as to whether our concerns and EPA's concerns about indoor air and radon, particularly, are well-founded.

The New York Times in March did a piece in which it criticized the agency's estimates that radon could cause up to 20,000 cases of lung cancer a year. I quote from the New York Times on March 24, 1993,

> That estimate has come under intense criticism from many radiation health specialists who have called it unscientific and wildly exaggerated.

Would you talk for a bit about the basis of EPA's estimate that radon causes between 7,000 and 30,000 lung cancer deaths in the United States each year?

Mr. SUSSMAN. I would be happy to address this issue.

I am not a scientist, Mr. Chairman, but my sense in talking to the EPA staff is that we have an unusually robust database on radon compared to many other types of contaminants that the agency regulates.

First of all, we have extensive epidemiology data involving miners exposed to radon over long periods of time. Some of those miners were exposed to elevated levels, but many were actually exposed to radon levels comparable to those which are found in homes. My understanding is that these epidemiology studies have been through extensive peer review by independent experts. Those experts believe indeed that there is a strong association between lung cancer and radon exposure. We also have animal studies which show that exposure to radon can cause lung cancer.

So we have a significant body of evidence which implicates radon as a source of lung cancer.

I also should say that many independent scientific bodies have evaluated EPA's radon risk assessment and have concluded that it is scientific and supportable. For example, the carcinogenicity of radon has been established by the World Health Organization, the National Academy of Sciences, the International Commission on Radiological Protection, and the National Council on Radiation Protection in measurements.

So yes, there are uncertainties. There are always uncertainties and we need to try to reduce those uncertainties to the extent we can. But we have a good database here and the agency is comfortable that we have a sound risk assessment.

Senator LIEBERMAN. So I hear you to say that not only has the agency reached this conclusion, but that the clear preponderance of scientific evidence is that radon is a substantial cause of health problems, particularly lung cancer?

Mr. SUSSMAN. That is our belief.

Senator LIEBERMAN. Let me ask you finally, before my time in this round is over, How would you compare the strength of EPA's risk assessment for radon with other risk assessments for other environmental contaminants?

Mr. SUSSMAN. I think that this is an unusually strong risk assessment because we do have human epidemiology data in the case of radon. For many other chemical contaminants, we either have no epidemiology data at all or we have inconclusive data and therefore must rely on animal studies.

In the case of radon, we have a convergence of human data and animal data. That gives us a pretty clear picture.

Senator LIEBERMAN. Thank you. That's great.

Senator Lautenberg?

Senator LAUTENBERG. Thank you very much, Mr. Chairman.

Is it fair to use the estimate of risks obtained in mines for the same risks posed in homes or public facilities? I think much of the contest and the disagreement about the reliability of the data has to do with sampling size.

By the way, is that correct that those who challenge EPA's conclusions—has it been EPA's response that the samples have been relatively small with the opponents' analysis?

Mr. SUSSMAN. That may be one of the issues. My understanding is that there are two other issues. One is whether there were compounding exposures in the mines which would not exist in the home. Another issue is whether the exposure levels in the mines were elevated and therefore were not representative of residential conditions. My understanding is that we have looked at both of those issues and we feel that our risk assessment adequately accommodates them and takes them into account.

I also ought to point out that anytime the agency examines an alleged carcinogen, we are generally dealing with data that comes from one situation or one type of study and extrapolate it to another type of situation or study. For example, we very often extrapolate from occupational studies to general population exposure. So it is not an unusual or unorthodox step for us to take human epidemiology data involving miners and try to extrapolate it to the residential situation.

Senator LAUTENBERG. Margo, would you like to add any further comment?

Ms. OGE. Senator Lautenberg, I would agree completely with Mr. Sussman.

At EPA, as you know, we have a handful of known human carcinogens. Radon is a known human carcinogen. Most of the chemicals—the thousands of chemicals that we deal with in our agency—we extrapolate from animal studies. Here we have animal data and we have human data. We do have uncertainties and the agency is working very hard with the National Academy of Sciences to address those uncertainties. A range of 7,000 to 30,000 tries to quantify the uncertainties with which we are dealing.

We have a new study with the National Academy of Sciences to continue to refine our knowledge. But the question is, Do we have a good basis to proceed to inform the public and take action? That answer is yes.

Senator LAUTENBERG. One of the things that is left out of commentaries is the combination of smoking with radon—that is like a real time bomb, as I understand it—or other kinds of illnesses that might be present. Now, you add radon on top of that, and it is almost like a firestorm, if I understand it correctly.

Mr. SUSSMAN. That is absolutely right. There clearly seems to be a synergistic effect between cigarette smoking and radon exposure. Individuals with exposure to both are at significantly greater risk than individuals who are exposed to either alone. You are absolutely right about that, Senator.

Senator LAUTENBERG. What is EPA's estimate of the risk to children from exposure to radon? Is it at a substantially higher level than adults?

Mr. SUSSMAN. I will try to answer that and then turn to Ms. Oge.

My understanding is that we have not identified factors which demonstrate that children are unusually susceptible to a greater extent than other members of the population. But of course, the risk to the population is a significant risk, so therefore children are very much at risk as well.

Senator LAUTENBERG. Did you I misunderstand that children are not more susceptible than adults? Is that true? The injection of air is at a much more rapid pace with children than it is with adults, as I understand it.

Ms. OGE. Senator Lautenberg, we have very limited data on children's exposure to alpha radiation through radon. Based on the data that we have and the advice that we received from our Science Advisory Board, we believe that children are not at higher risk to radon than adults, although we do know that children can be at higher risk from other forms of radiation.

So based on the current knowledge that we have on this issue, we don't believe that children are more susceptible to radon than adults.

Senator LAUTENBERG. Mr. Chairman, I thank you and Mr. Sussman and Ms. Oge.

Senator LIEBERMAN. Thank you, Senator Lautenberg.

I am just going to ask you a few more questions briefly.

As you stated, Mr. Sussman—I think it is important to point out—this bill does not grant any new authority to the agency. It puts the agency in a coordinating posture. It is important to point that out.

You indicated the concern that EPA not dictate to other departments. I am sure that we all share that concern, but the bill really intends for EPA to play a leadership role here to make sure that we are getting the most out of our resources.

Do you agree that EPA should take a leadership role in indoor air pollution and work with other agencies to plan for an effective response to this problem?

Mr. SUSSMAN. We certainly do agree that EPA should play a leadership role. We think we have a lot of experience and expertise to offer on indoor air quality issues and we want to maximize the contribution that we can make.

We also see a strong need, as you do, for interagency coordination. For example, one of the provisions of the proposed bill would mandate preparation of a national action plan or strategy on indoor air pollution. We see that as a useful step and we certainly see EPA playing a very central role in the preparation of that plan.

Senator LIEBERMAN. I appreciate that answer.

EPA has recommended that all homes be tested for radon, but the best data I have seen suggests that nationwide only about 8 to 10 percent of the homes have been tested.

This legislation again takes a moderate point of view and requires the seller of housing to provide the purchaser with radon information in a pamphlet and also to disclose to the purchaser the presence of any known levels of radon and to permit the purchaser of the housing a 10-day period in which they can conduct a test to determine the level of radon in the housing.

Do you want to talk at all about how much radon testing actually occurs now during real estate transactions? Looking forward, do you anticipate that the rate would increase if home buyers are given information about radon?

Mr. SUSSMAN. I think we do anticipate that will happen.

My understanding is that radon testing is conducted with regard to 16 percent of all home transactions now nationwide. I believe that is the figure. We do need to do better than that.

Our hope and I think the subcommittee's hope is that if information about radon risk is provided to purchasers of homes, and if there is a 10-day waiting period, that will operate as an incentive to encourage additional testing. That is certainly what we hope will occur if the bill is enacted.

Senator LIEBERMAN. My last question is on carpets, on which I held a hearing last year when we heard some disturbing testimony from a private laboratory about the impact of some carpets on indoor air pollution on the people who breathe the air.

I know EPA has been going through a verification process with regard to carpet samples. Have you reached a point where you can indicate to us what your conclusions are?

Mr. SUSSMAN. We are getting there, Mr. Chairman. We are not quite there yet. I believe you are referring to the Anderson Labs study.

Senator LIEBERMAN. That is correct.

Mr. SUSSMAN. We are conducting a collaborative project with Anderson Labs to attempt to verify and confirm the original testing. Our collaborative testing is complete and in fact is undergoing peer review this week. Following the completion of peer review, we would hope to develop and release a report. We are now anticipating that we will be able to do that in early June.

Senator LIEBERMAN. That timing is helpful because we may want to include the results of your report or respond to them in this legislation on indoor air as part of our markup.

I thank you Mr. Sussman and Ms. Oge for your testimony and for your support.

Senator LAUTENBERG. Mr. Chairman, since we are at round two, I will take advantage and ask for a very short response to these few questions.

How significant is the radon problem in schools?

Mr. SUSSMAN. We believe that it is a serious problem that needs to be addressed. We think a significant number of school buildings nationwide will have at least one classroom with elevated radon levels.

Senator LAUTENBERG. What is the yardstick?

Mr. SUSSMAN. I think it is 4 pCi/L.

Senator LAUTENBERG. The action level?

Mr. SUSSMAN. Right.

Senator LAUTENBERG. Are we giving guidance to help schools test for and mitigate elevated levels? Is that information generally distributed?

Mr. SUSSMAN. Yes, it is.

Senator LAUTENBERG. Are schools currently testing for it and then working to mitigate the radon problems?

Mr. SUSSMAN. It is my understanding, that schools are testing, perhaps not to the degree that we would like, but they are testing. Mitigation, however, is another matter. My impression is that we are not seeing a significant amount of radon mitigation in schools. This is an issue that is of concern.

Senator LAUTENBERG. The cost is a very significant consideration for school districts.

Are the States using the radon grant funds that are available to pay for the cost of testing? Are they taking advantage of that?

Mr. SUSSMAN. Yes, they are.

Senator LAUTENBERG. And last I will close with an observation, Mr. Chairman.

Again, because of the invisible nature of radon gas and the lack of signs that give you any warning, it is a very tough program to sell. I have talked to people in the real estate business and I have talked to individual home owners, including a niece of mine who was in the process of selling a home to an architect, they are hard to convince. Why are we going through this process, because everybody has to be aware that there is a problem and I don't believe a lot of people are talking about radon over the dinner table.

Therefore, I think it is incumbent upon us, if our assignment is to protect human health, to make sure that the information is out there in sufficient quantity and easily understood so that people are alerted to this danger and we can do something about it. For us just to talk to one another about it is interesting, but in the final analysis, it doesn't get legislation passed.

I hope that we will be able to look to EPA to get some guidance there to design the kind of programs that have an impact.

Thank you very much.

Senator LIEBERMAN. Thank you.

And this is a classic case where we really have to lead because we see something that literally others don't see.

Our next panel consists of Dr. Jill Lipoti, Dr. Genevieve Matanoski, Ms. Arlene Zielke, and Dr. Thomas Godar.

Ladies and gentlemen, thank you very much for being here.

Dr. Lipoti is the assistant director for radiation program programs at the Department of Environmental Protection and Energy in New Jersey. We thank you and look forward to your testimony now.

STATEMENT OF JILL LIPOTI, ASSISTANT DIRECTOR FOR RADIATION PROTECTION PROGRAMS, DEPARTMENT OF ENVIRONMENTAL PROTECTION AND ENERGY, TRENTON, NEW JERSEY

Ms. LIPOTI. Thank you.

I really appreciate the opportunity to testify both on behalf of my own State and also as a representative of the Conference of Radiation Control Program Directors.

I would like to begin my testimony by thanking Senator Lautenberg for his leadership in the area of radon. Radon is an environmental issue with no human villain, and we have found a human hero. We thank you.

I first want to emphasize that we remain very concerned over the seriousness of the radon risk in New Jersey. We have done our own risk analyses and we predict more than a death a day in our little State of New Jersey.

Senator LIEBERMAN. More than a death a day from lung cancer associated with radon just in the State of New Jersey?

Ms. LIPOTI. That is correct. It is higher than the risk of any other environmental issue in New Jersey.

Concerning the legislation before the subcommittee, both the Conference of Radiation Control Program Directors and the New Jersey Department of Environmental Protection and Energy support the continuation of the grants assistance to State grant programs. That program is allowing many States to start a radon program and others to address special issues.

In 3 years of funding in New Jersey, it has allowed us to work on a number of useful projects that benefit all States. We have examined mitigation efforts that were either done by a professional or done by do-it-yourselfers for those that failed to mitigate and lower their radon to acceptable levels. I think the research we have done there will show others how to better mitigate.

We have developed school activities for high schools and middle schools and are in the process of developing them for elementary schools to teach about radon and the comparative risks. We have addressed radon in the urban environment, we have trained State and local construction officials on the components of the New Jersey radon hazard subcode for new construction, and we are developing a more streamlined protocol for identifying and studying the elevated radon target areas, those that are greater than 200 pCi/L. We have also investigated through a survey the role of radon in real estate transactions.

I have to address, however, the amendments in the bill regarding the grants assistance program where the State matches at 50 percent. It is very important to the small radon programs in States—the one to two people operations—they really have difficulty meeting that 50 percent match. We recommend that the Federal share be at least 75 percent in each of the continuing years of the program.

I guess the crux of my testimony—and the full testimony is provided for you in the record—is, What should be the respective roles for the Federal Government and for the States in addressing this radon issue? There aren't enough resources to go around to provide for overlap. We want to do the best we can with the money that is available. The mandatory radon proficiency program is one that we don't think should be addressed in the bill and should be left to States.

There are a few examples where the voluntary program has been expanded and grown in the last few years where now it could interfere with components of established State radiation certification programs. The EPA's current radon measurement proficiency program added components involving a measurement contractor exam, quality assurance plan and protocol, and reporting requirements. We are concerned that as a practical matter over time the components of a Federal program could supplant the major portions of a State program.

While that is important in terms of the radon measurement proficiency test, in New Jersey we had to establish an alternate RMP to certify all our professionals. We're not clear on how that will affect it.

We are really concerned in terms of funding. The assumption was that under the State indoor radon grants program that the State programs would be seed money and State programs would eventually take over and become self-sufficient. If EPA is going to do it, then the States won't be able to charge fees, have a certification program, and be able to have their own self-sufficient program. So we really need to look at this issue in terms of what the States should do and what the Federal Government should do for us.

Right now we used our State certification money as the State match for the Federal/State indoor radon grants fund that allows us to do those projects that I mentioned at the outset. So if EPA takes over that certification program, what are we going to do?

We think that a traditional Federal regulatory program with delegation to the State is not really warranted regarding radon services. While it may be warranted for things like the Clean Air Act and the Clean Water Act, that is a different area where there really should be something provided for all United States citizens to be protected. But in the radon situation, I think States need greater flexibility.

We have made some recommendations regarding the national effort and we have made a recommendation that would divide the current radon measurement proficiency program into four separate phases that would allow States the flexibility to take over one, two, three, or four of those phases. I think there have been some good recommendations in our testimony and I urge you to take a look at it. I won't summarize it all here, but I think you have really done a great job in bringing the issue before the public. I have to commend you for that.

Thank you.

Senator LIEBERMAN. Thank you, Doctor. Your testimony will be included in the record, as will that of all the other witnesses.

Senator LAUTENBERG. Mr. Chairman, I apologize but I have to go to another hearing. I would like to compliment Dr. Lipoti for her statement; I may be submitting questions in writing.

Senator LIEBERMAN. We will go now to Dr. Matanoski.

STATEMENT OF GENEVIEVE MATANOSKI, SCHOOL OF HYGIENE AND PUBLIC HEALTH, THE JOHNS HOPKINS UNIVERSITY, BALTIMORE, MARYLAND

Ms. MATANOSKI. Thank you.

I am Dr. Matanoski, a professor of epidemiology at Johns Hopkins in Baltimore. I am a physician and epidemiologist and the Chair of the Radiation Advisory Committee of the Science Advisory Board of the Environmental Protection Agency.

I am not appearing today on behalf of the Science Advisory Board since the committee has not had opportunity to review any of my testimony, but it is my intention to talk just a bit about the background information and the public health implications of the Indoor Air Act.

The importance of radon in terms of a risk of lung cancer is well-known to scientists. I don't think any scientists at the present time are questioning whether radon can cause lung cancer in humans. It certainly can.

The only questions that really arise is, What level shall we place in terms of action for the residential community? The reason there are questions there is that there are a lot of uncertainties as far as the residential community is concerned. These are a lot of biological questions, questions in terms of extrapolation to females and children where we have no data or very little data in the mines for females and children, the actions of the actual work level in the mines versus what we do in homes where we don't perhaps work quite as hard as miners do, and the materials that are around the mines. So there are some basic scientific questions that exist.

The problems that seem to arise are more policy in terms of whether 4 pCi/L is the appropriate cut point. The interesting piece of this from the standpoint of the Senate committee, who has proposed indoor legislation, is the new impact that this actually represents in terms of the EPA. Most of EPA's legislation has, as Mr. Sussman pointed out, been based on animal data. Very little is actually based on human data.

So we have a very strong human component to this. But a problem we have is that the majority of people are exposed at very low levels. For the first time, you are asking people to do something to themselves. In other words, you are motivating people to do something about their home. Most of the time, EPA has been able to take a stand in terms of a source and said that they would get rid of the source. But this is a natural background gas and we can't get rid of the source. So we have to ask the people to do something about their own homes.

This is where we are having a real problem and EPA needs an enormous amount of support and help, as much as they can get.

About this new direction, indoor air is a personal thing except where you get to buildings or schools where we can legislate something or transfer property where we might be able to legislate something. When we go to the individual, we have to motivate them. We have to do the same thing the medical community tries to do when we get women to do pap testing or women to do mammography, or whatever screening we ask to do. It is a personal kind of risk.

Then the EPA has to tell them that if they have no exposure to radon maybe your risk is about seven per hundred. But if you are exposed at 4 pCi/L it is nine per hundred. People will say, "Well, that is 1 in 14 and now you have made it 1 in 11. That doesn't make a lot of difference to me."

But in order to find out the high risk homes, they are going to have to get everybody to test. So they need a whole new direction in terms of support and funding for the activities in the radon area to approach the problem from a totally different standpoint than usual. We can't get rid of sources, we have to get people to test their homes. This is a very different approach for EPA.

I simply am strongly supportive of this legislation. I think the indoor air is where we are going for the future. The EPA is certainly the groups that needs to take a lead in this and will need a lot of support and help from the standpoint of both legislation and financial support.

Thank you.

Senator LIEBERMAN. Thank you, Doctor. I look forward to coming back during the question period.

Ms. Zielke is representing the National PTA and the National Education Association.

Welcome.

STATEMENT OF ARLENE ZIELKE, VICE PRESIDENT, LEGISLATIVE ACTIVITY, NATIONAL PARENT-TEACHER ASSOCIATION, WASHINGTON, D.C.; ALSO ON BEHALF OF NATIONAL EDUCATION ASSOCIATION

Ms. ZIELKE. Thank you, Mr. Chairman.

I am Arlene Zielke, the vice president for legislative activity for the National PTA. I am here today representing the National PTA and the National Education Association. On behalf of our combined membership, I thank you for this opportunity to bring testimony on S. 657, the Indoor Radon Abatement Act of 1993.

The National PTA and the NEA have long been active in efforts to ensure that schools provide a safe and healthy environment for their students and staff and will try again this year to secure Federal legislation requiring schools to test for hazards including lead and radon. My written statement is more comprehensive and I ask that it be entered into the record in all detail.

To begin, it is useful to repeat the EPA's contention, which we recognize, that there is no known safe level of exposure to radon, but that radon is the number one environmental cancerous risk facing the Nation today. In fact, radon ranks second only to cigarette smoking as a cause of lung cancer fatalities.

We were surprised to hear in the testimony of EPA that children are not at a greater risk than adults. However, scientists have testified in previous hearings that they are at greater risk. Because children are in the early stages of their development, they are at a greater lifetime risk of developing cancer as a result of radon exposure. In fact, our longer statement indicates the Council of Radiation Control Program Directors has stated that exposure to radon during the first 10 years of life represents one-third of the risk of total exposure over 70 years.

EPA has just released recently its results of a national survey of radon in schools conducting tests in over 900 schools across the country. We find the results alarming. There are over 70,000 classrooms in over 15,000 public schools with radon levels above the EPA action level. Nearly 10 percent of the schools nationwide had three or more rooms with dangerous radon levels and over 5 percent of the schools had six or more rooms with dangerous levels.

In over 10,000 classrooms across the country, radon exposure levels exceed what is allowed in nuclear powerplants. The highest reading in this level was 67 pCi/L. However, EPA has found radon screening levels exceeding 100 pCi/L in other schools in the United States.

All in all, EPA estimates that almost 20 percent of the Nation's public schools have at least one ground contact room with radon above 4 pCi/L. This is a much higher percentage of schools with dangerous levels of radon compared to EPA's estimate for homes, which is 6 percent to 7 percent.

Another important finding of the EPA survey in schools is that radon was found in many schools in areas not known to have high radon concentrations. This confirms the need, as EPA has stated, to test all schools. In fact, by only testing schools in areas suspected to have high levels of radon, EPA estimates that 59 percent of schools with elevated radon levels would be missed.

Unless schools are tested, we will not know if they have a radon problem or any other indoor air quality problem. We know from our experiences with lead in drinking water and asbestos in schools that voluntary testing programs are not sufficient. Some States and school districts will test and others will not. In order to ensure a nationwide uniform system of testing, we must have Federal legislation.

The National PTA and the NEA agree with the EPA recommendation to test all schools for radon. We believe S. 657, while taking steps in the right direction, must be amended to require testing in all schools.

We also believe that the Federal Government has a responsibility to be a full partner with the States to help local school districts with this task. EPA can assure that workers are properly trained and certified and provide information and technical assistance to the schools.

The Federal Government must also assist schools financially with addressing this problem. In addition, we believe enactment of S. 657 is entirely consistent with achieving the national education goals, particularly goal number six, which addresses the need of schools to provide children with a safe environment conducive to learning. We further believe that testing for radon will lead to cleanup of other hazardous indoor air pollution problems that we know exist in the schools.

Both the NEA and the National PTA have been strong supporters of legislation to combat and eliminate environmental hazards in our Nation's schools. In the past two Congresses, we have supported radon legislation which was passed each time in this chamber. Similarly, we supported Senator Mitchell's past attempts to pass indoor air legislation and his current bill, S. 656, the Indoor Air Quality Act of 1993. We also support Representative Kennedy's companion bill, H.R. 1930.

We believe S. 656, H.R. 1930, and S. 657 are complementary efforts. We are pleased that the indoor air bills direct EPA to conduct a national assessment of the seriousness and expense and indoor air contamination in schools and day care centers. We applaud your efforts and pledge to work with your staff.

In the few minutes that I have left, I would like to point out our recommendations for the bill.

We believe that all schools must be tested, particularly in light of the results of EPA's study of radon in schools. We urge you to extend the testing requirement in the bill to all schools. The notification provisions should be clarified. First, they should be required to make available in each individual school the results of the testing in that particular building along with recommended mitigation or other follow-up procedures.

We also recommend that EPA require school districts to designate someone to be the radon contact in that district. Currently, school districts have such designees for asbestos, as required by the Asbestos Hazardous Emergency Response Act. These contacts are very useful in helping at the local level to coordinate testing and mitigation activities and providing parents, teachers, and others with information about radon in their schools and in working with the State radon contacts.

We would like to have a separate funding authorization for a grant program specifically for schools. We recommend that $20 million be authorized each year for 5 years for a total of $100 million. We believe this amount represents a reasonable share for the Federal Government to assume in this effort based on EPA's estimates of the average costs of testing and mitigating schools.

In closing, we cannot ignore this problem, Mr. Chairman. We cannot postpone testing or mitigation efforts because of monetary costs at the expense of health to our children. It is ironic that in today's furor over educational reform, the quick-fix approach to perceived failures in academic achievement is to test, test, test. But with regard to environmental hazards which we know pose tremendous dangers to children, schools are opposed to testing, which is the only effective way to correct the problem.

I thank you for the time offered us this morning.

Senator LIEBERMAN. Thank you.

Our next witness is Dr. Tom Godar, the director of Saint Francis Hospital and Medical Center in Hartford.

It is a pleasure to welcome you here. I am proud that you are a resident of Hartford and we look forward to your testimony.

STATEMENT OF DR. THOMAS J. GODAR, M.D., DIRECTOR, ST. FRANCIS HOSPITAL AND MEDICAL CENTER, HARTFORD, CONNECTICUT; ON BEHALF OF AMERICAN LUNG ASSOCIATION

Dr. GODAR. Thank you, Mr. Chairman.

I am here on behalf of the American Lung Association and have been past president and for some years one of the more common spokespersons on behalf of clean air.

In the last 10 years, the Lung Association has shifted much of its emphasis, in fact, to indoor air concerns. As is clear as we gather more research, the original observations that outside air pollutants might concentrate several times above ambient air indoors has simply been expanded. I believe the initial observations were with nitrogen dioxide with the use of gas for both heating and cooking with inadequate ventilation. That led to levels several times the outdoor ambient air level.

Carbon monoxide presents the same problem. You add to that list the number of pollutants that are more likely to be found in high concentration indoors because of their use or propagation indoors and we have in fact a highly separate problem of air pollution that warrants our attention.

It is true that we spend most of our time indoors. It is also true that we have a problem in which there seems to be no specific jurisdiction. That is, the individual home is not as clearly under the jurisdiction of EPA as perhaps it ought to be.

We are here to actually express our appreciation for both of these bills and for your leadership and to indicate that we strongly support both bills.

I am going to make some general comments. We will submit our written testimony, but I will highlight certain areas that concern us.

First of all, we are concerned that the indoor air problem is really everyone's problem, whether it is a non-industrial work place, in the home, or in the school. We have to think of this as a very, very broad problem, not limited to office problems but in fact even in individual homes.

In addition, the average home owner has very little knowledge of indoor air pollution hazards or mechanisms. I regret to say that the medical profession has almost as little appreciation. As a consequence, our first step has been to intensively educate the medical professionals in terms of the need to understand indoor air pollution as a problem.

The section on indoor air quality research is particularly important because it allows us to gather more information on chronic, low-dose exposure, which we think is important. We believe that more information on human exposure to indoor contaminants is necessary to convince the public and perhaps to reassure ourselves that this is a health problem. There is not a pulmonary physician in practice who does not appreciate that indoor air pollution is a problem because we see these on almost a daily basis.

However, we do need to include a plan to conduct national assessments, which is part of the bill, S. 656, and we are delighted to see that. We believe that there are some concerns. Many of our homes, schools, and office buildings do not have adequate ventilation or the ventilation is not adequately maintained. That has been addressed.

The average building, non-industrial occupational building or even in some cases schools, are at the present time decades old and may be seeing their fourth occupant. This means that the building use is now sufficiently deviant from the original design and the changes in ventilation system and air current in fact has caused problems in addition to the reduction of fresh air for the purpose of energy savings. So we are seeing problems literally on a daily basis.

If we review the issue from indoor radon and environmental tobacco smoke and the potential for cancer of these agents, this could as easily occur in homes and in certain school buildings as in the non-industrial work place. We think that in adults poor ventilation is a key factor to symptoms and to some of the work-related illnesses, and in fact, those that are not work-related.

We believe that government at all levels should be concerned with the issue of ventilation and the establishment of better standards. We also endorse section 7, indoor air contaminants health advisory. This is extremely important in educating the public and in educating the health care professional.

We would like to suggest that in your list of reviews that nitrogen oxide is actually not a problem and this should probably be modified to include nitrogen dioxide, which is known to be a respiratory irritant and does have health effects.

We support the more rapid time frame for the development of health advisory in the Mitchell bill and feel that is important to getting the job done. We encourage the subcommittee to monitor closely the appropriations process since the issue of funding has come up several times this morning. It is clearly going to be one of limitations.

Section 13, Council on Indoor Air Quality, we think is excellent. If you look at the list of common indoor air pollutants, it is a very, very diverse list. It is very difficult to understand how any single agency could in fact command knowledge and disseminate knowledge on all these—biological aerosols, formaldehyde, carbon monoxide, radon, asbestos, environmental tobacco smoke, which it itself is responsible for perhaps an estimated 3,000 excess lung cancer deaths alone, in addition to contributing to heart disease and other cancers.

This list means that we need the coordinated efforts of EPA, OSHA, the Department of Energy, and the Consumer Product Safety Commission. But we see a lack of a central leadership, and therefore we are strongly urging, as we have in the past, that EPA take the leadership role, that interagency cooperation continue, and that EPA be given the chairmanship beyond the 2 years proposed in the bill.

To finish, on the issue of radon, perhaps I can serve as a resource in terms of some of the concerns to human health regarding radon. The EPA and the American Lung Association for at least 4 years have jointly tried to stimulate the public's interest in radon and has met with what I would classify as a cataclysmic yawn of indifference. Literally, nothing has happened.

Perhaps that is not totally accurate. The testing rate is probably 11 percent in homes versus 5 percent some 10 years ago. But I consider that almost inaction. My efforts to educate health professionals to the reasonable risk of radon has not met with much success, either. I believe that, like the public, they are suffering from a circuit overload. They have other more serious priorities to managing cancer, AIDS, and other disorders, which are taking a lot of their energy and time. As long as the endpoint radon exposure is cancer occurring decades later, it is very difficult for them to focus in, particularly in the absence of direct human evidence other than modelling provided by the miners' experience.

Let me tell you that I have on a regular basis consulted with someone whom I implicitly trust, Dr. Jonathan M. Samet, who is professor of medicine and pulmonary diseases in New Mexico, a leading epidemiologist in lung cancer, and himself an evaluator of some of the mining experience. I have regularly asked him what he believes to be the likely lung cancer induction by radon exposure alone.

I did not believe EPA's original upper estimate of 25,000, but I did believe 5,000. He indicated that he thought the risk was real, but he wasn't sure where the number was, but that it would probably lie between 9,000 and 10,000. We know that independent research has demonstrated levels range from 7,000–30,000, with midpoints as high as 14,000. He continues to believe that it represents a real threat.

Therefore, I would like to comment that although the data on the human health risks of residential radon exposure is not as definitive as we may desire, we are dealing with lung cancer, which has one of the lowest 5-year survivals of all human cancer. There is only one approach to lung cancer, and that is prevention, prevention, prevention. Radon is a key way in which we can prevent lung cancer. Our megatechnology has not resolved that problem and is unlikely to in the next decade.

I would like to congratulate your for two excellent bills and the American Lung Association stands ready to support you in any way we can.

Thank you, Mr. Chairman.

Senator LIEBERMAN. Thank you, Doctor.

So you clearly do not share the assessment that I repeated from the New York Times that the data is unscientific and exaggerated when it comes to the radon link to lung cancer?

Dr. GODAR. I do not. I believe, for example the upper level of radon data is viewed by many scientists without a great deal of insight and knowledge as probably too high.

Senator LIEBERMAN. Right.

Dr. GODAR. But if we look at even 7,000 excess deaths and you consider the lost time from work, to say nothing of what attorneys call pain and suffering—which, frankly, from lung cancer is very substantial.

We really need to do all we can to prevent even 7,000, 10,000, or the more commonly accepted 14,000 excess deaths.

Senator LIEBERMAN. That is an important statement.

So even if you accept the lower level of numbers here, each case is so severe, both for the individual in terms of being cured and in terms of the pain and suffering and cost, it still amounts to a very serious health problem.

Dr. GODAR. Absolutely.

Let me point out why it concerns the medical profession.

In the 1950's, the 5-year survival—and I have studiously avoided the word "cure"—is in the nature of the tumor between 9 percent and 12 percent in most series. In 4 decades, we have made substantial progress to something like 15 percent to 18 percent 5-year survival. Virtually no progress, in spite of preventative programs, surveillance programs, new radiation techniques, new chemotherapy, and much better surgery.

Senator LIEBERMAN. Dr. Matanoski, let me just continue with you for a moment on this.

As I understand it, you are the Chair of the radon panel of the EPA Scientific Advisory Board. So in that sense, I gather that your panel is the source of the risk assessment here.

Ms. MATANOSKI. We review the risk assessment that EPA does.

Senator LIEBERMAN. And you, in that sense, endorsed it and approved it?

Ms. MATANOSKI. Yes.

Senator LIEBERMAN. Could you just take a moment to tell us a little bit about the kinds of people who are on the panel and the nature of the process you followed to review the risk assessment here?

Ms. MATANOSKI. The EPA gives us the document with the supporting pieces of documents, which have gone into their risk assessment. We are allowed to question them and ask whatever we need in order to be sure that we are comfortable with their assessment. Under those circumstances, we have done that both with the radon and indoor air and we have done it for radon and other sources.

I would like to point out that the use of the model which they have taken to extrapolate from miner data to human data has been done with a great deal of attention to uncertainty. Using those uncertainties about whether it is different in females versus males and with respiratory function and so forth—putting those into account, they have come up with this range that you see of 7,000 to 30,000. So it has been done with a lot of thought about the uncertainties that Dr. Samet has pointed out to Dr. Godar.

Even with those, you can see that the middle range of about 14,000 is higher than any other pollutant for lung cancer.

Senator LIEBERMAN. Again, I gather that within the range of your experience—a case has been made here that it is substantial as compared to other environmental contaminants for which risk assessments have been done.

Ms. MATANOSKI. In the sense of other ETS, for example, it is only about 3,000. This, at the minimum, is about 2.5 times that.

Senator LIEBERMAN. Thank you.

Dr. Godar, one of the advantages you bring to the table is that you are a practicing physician. Could you speak for just a moment about some of the other illnesses that you have seen in your practice that you believe are caused by indoor air pollution?

Dr. GODAR. In the last 10 years, we have seen increasing numbers of occupational asthma originating from the industrial sector. It may represent anhydrides or isocyanides, specifically sensitizing agents or combinations of agents. Therefore, we are prepared to see patients who themselves are beginning to consider seeing a psychiatrist because they have no explanation for their bizarre complaints and their doctors are unaware of how they can connect their complaints with their occupational exposure, or may not ask that question in the first place.

Therefore, we are keenly aware of the subtleties of environmental exposure. In the last 5 to 6 years we have in fact seen literally a small epidemic of building-related illness in a non-industrial setting. In addition, we have seen the less-precise sick building syndrome in which simple things such as inability to concentrate and fatigue are frequently complained of by employees and regarded by the employer as just someone who has a hangover or doesn't wish to work.

No one is in fact looking at whether this in fact represents a true problem within the work place. Almost without exception, we find inadequate ventilation in those buildings and almost without exception there is no single pollutant at a sufficient level to cause alarm, although formaldehyde may be the most commonly identified. In general, it is inadequate ventilation.

Two things need to be said about this. The recent article in the New England Journal of Medicine (3/25/93, Volume 328, pp. 821–827) indicates that Canada where they have found a ventilation problem in the non-industrial office building and corrected it, they only obtained a partial response in the patients who had been ill for several months. That is, they improved clearly, but not entirely. Mr. Chairman, I ask that a copy of this article be inserted into the hearing record.

Our experience with occupational asthma is that once induced and not removed by removing the individual from the repetitive exposure, that process may become fixed. There may be permanent injury. The concept that we can withdraw people and have them return to normal proves to be erroneous.

This is mind-boggling to physicians who are accustomed to finding a cause, applying a cure, and expecting a response.

Senator LIEBERMAN. Imagine how the average patient reacts.

Dr. GODAR. It is absolutely devastating because they are frankly viewed as neurotic by their peers. Occasionally, when you talk to individuals they can name five or six people in their office with similar problems, only one of whom, perhaps, will come forward because they are concerned about their job. And that introduces another element in that obtaining a history and finding someone to earmark the problem is very, very difficult.

Senator LIEBERMAN. Is it the primary physiological impacts you're talking about that may be hard to reverse on the lungs?

Dr. GODAR. It is generally on the upper respiratory track, but for some it actually represents lower respiratory track problems such as an unexplained bronchitis in a non-smoker with no other obvious cause and no acute viral illness.

Senator LIEBERMAN. Let me welcome my friend and colleague, Senator Faircloth, and ask him if he would like to get into this with a statement or questions.

Senator FAIRCLOTH. Thank you, Mr. Chairman.

I know some of you are here to speak on indoor air quality in general and others are to speak on radon in particular. I have some questions on both that I would like to bring up.

My concern is that we may mandate that the EPA implement something that carries tremendous liability to the makers of products that are associated with a potential listed contaminant and that EPA has not given any clear guidance as to the scientific basis for listing a contaminant.

For those of you who are not familiar with the extent of this problem, let me point out to you that this would not be the first time that Congress legislated on complicated environmental issues on the basis of unscientific information. Let me point out three recent articles covering the problem.

The Wall Street Journal on March 2nd, "How Sand Came to be Defined as a Human Carcinogen." On March 3rd, the New York Times, "Animal Tests are Risk Clues. The Data Falls Far Short." New York Times, the 25th, "Second Chance on the Environment."

We know that the Federal, State, and local governments spent over $3 billion on asbestos removal from buildings last year. In one year, we spent $3 billion. Yet the most comprehensive study of asbestos exposure done on asbestos miners in Canada found that asbestos exposure poses no long-term health risk. In fact, the Occupational Safety and Health Administration says, "We spent an awful lot of taxpayer money on asbestos removal without decreasing risk."

If asbestos is an overblown risk, how can we be assured that radon is not also an overblown risk?

Ms. MATANOSKI. I don't think that asbestos is an overblown risk. The risk for asbestos, independent of smoking, is four-fold. If you add smoking to it, you have a 40-fold increased risk of lung cancer. I don't think that is overblown.

The problem is, What do we do about it? Do we lift it out of schools or do we cover it over? I think that is a very good issue.

Senator FAIRCLOTH. What did the Occupational Safety and Health Administration say?

Ms. MATANOSKI. It isn't a risk for other things than lung cancer, but it is a risk of lung cancer that has been well-known for a long time.

It is probably at what level and under what circumstances.

Senator FAIRCLOTH. EPA says that Iowa has the highest radon exposure of any State in the Nation, that 71 percent of the homes are over the EPA danger level. Yet the lung cancer rate in Iowa is 13 percent below the national average. Is this any evidence that radon risk is overblown?

Ms. MATANOSKI. We find that what happens is—if you take a whole State like that, there are areas that are high and areas that are low. So you can't take total State data to look at. That is what we call in epidemiology an ecological study. The problem is that it is not getting to individual risk.

If you go down to the smaller county levels, if you go down to the individual levels, that is where you begin to see the differences in radon exposed versus non-radon exposed. So a whole State will be reflective of a national average.

Senator FAIRCLOTH. Our EPA radon level is five times lower than the Canadian level. How did Canada miss it so far?

Ms. MATANOSKI. Actually, the problem is not—Canada as a whole may have a very high radon level. It has to be a house that is in the same area where the radon is and then the house has to leak. So you get down to the very specifics of whether there is a risk or not. There may be lots more uranium in the soil in Canada, but how much of the radon gas gets into the house where people live may be very different. You know that our population is much heavier.

Senator FAIRCLOTH. But our amount that we say is dangerous is five times lower than the amount that Canada says is dangerous.

Ms. MATANOSKI. That is absolutely right. They have come up with a different standard than we have.

I think I said when I started out, that the question comes not from whether radon is carcinogenic or not. I don't think there is any question about that. We have seen it in miners and there is absolutely no reason to think that radiation—basic radiation acts the same way in man as in animal, in female as in male. We don't really see any reason why the miner data shouldn't be extrapolated to other humans.

The whole problem is that there may be, for example, a difference in policy issues. Here the policy is to set the dose down to a point where we are protecting the risk in people at 4 pCi/L, which is about two per hundred more than it is at zero. So we are taking away 2 out of 100 lung cancers in this group that we would have had we not taken that kind of action.

Senator FAIRCLOTH. The Washington Times reported,

> The EPA risk assessment model on radon is based on a sample of 375 uranium miners in Colorado and Utah who died of cancer since 1960. To get the same amount of radon these miners got, you would have to live in an EPA dangerous level home non-stop for 475 years.

After that, maybe you ought to leave it.

Could this be one reason why Dr. William Mills, a scientist who determined the EPA radon danger level in 1979 now says, "We are just plain wrong"?

Could you comment on that?

Ms. MATANOSKI. The problem is the extrapolation down. The miners are obviously exposed at a much higher rate than the humans are in residential areas. That is absolutely true. But there are households that have exactly the same levels as there are in mines. They are not all the households and they are not most of the households at 4 pCi/L. That is the difference. There are a lot of households down at the lower end.

It is a log normal curve where there are a lot of people down at the low end and very few people up at the high end. The high end is the same as in the miners group. They have exactly the same exposures. The low end—we extrapolate down to that low end.

What happens? They have fewer deaths than the miners have, but they still have deaths. So they have a lower risk than the miners.

Senator FAIRCLOTH. I guess the point I am coming to is—I am a fiscal conservative, and yet I am very sensitive to the needs of the EPA to protect the health of the people in our country, to protect the water, to protect us generally to make sure that what we breathe, eat, and drink is wholesome. But it bothers me that on the radon program we are talking about spending $8 billion to $10 billion. As has clearly been proven, the wealth of this country is far from infinite.

I want to make sure that we don't take off on a tangent chasing an infinitesimally small health danger and deprive the health care system and the people of this country of money that could be used to protect a more current and realistic health danger. I think that we have tended to that in the tons of tests we can make on certain carcinogens and that sort of thing.

Would you comment on the dangers of going too far in looking for carcinogens and radon and extremism, as opposed to not spending the money?

Ms. MATANOSKI. I am with you. I like to save money, too. I think the Government needs to save as much money as they can. I think the question is how much money spent on 100,000—there are over 100,000 lung cancer deaths per year. If we take the lower limit that the EPA and the most conservative limit that has been given, it is about 6,000. That is somewhere around 6 percent of all lung cancer deaths that we might be able to prevent if we did some kind of radon testing and mitigation.

The cost of mitigation in most homes is relatively inexpensive. The cost of testing in most situations is relatively inexpensive. It is also geared primarily toward the individual home plus some that is geared toward health departments and so forth. But there is a lot of individual activity that has be done here. So the burden of much of the cost of the activity is going to be borne by the homeowner.

That is where I think the hard sell comes in this particular activity. It is a hard sell to the homeowners to take this action and put the cost in his pocket versus the Government's pocket. A lot of that is going to be based on the individual homeowner's pocket rather than the Government. But it is going to reduce 6 percent of lung cancer deaths, at a minimum, which we cannot find another way to treat them. The only way I know to prevent any of the others, of which 80 percent are due to smoking, is to stop the people from smoking. We have had a hard time doing that, too.

Senator FAIRCLOTH. How much would you estimate, per homeowner, this would cost?

Ms. MATANOSKI. It varies a lot.

Senator FAIRCLOTH. What would you guess to be the range?

Ms. MATANOSKI. In general, the range is estimated to be about $1,000 to $2,000.

Senator FAIRCLOTH. That is per house to protect it against radon?

Ms. MATANOSKI. In that house, right.

Senator FAIRCLOTH. The health advisory section of the Indoor Air Quality Act troubles me some. The health advisory section begins by telling the EPA Administrator to prepare a list of contaminants that may reasonably be expected to have an adverse impact on human health. That is pretty broad. What does "reasonably expected" mean and how will EPA interpret it?

I would hope in any case that it means something based on sound peer review science. What does that mean?

Ms. MATANOSKI. That I have trouble with. I don't know whether you mean that it is going to cause two per hundred deaths or one per hundred deaths or one per thousand. That I have a problem with. I am sure one of the things I can guarantee to you, though, is if any of the data comes to us in the radiation committee of the EPA Science Advisory Board, or if it goes to the Science Advisory Board itself, it gets pretty hard scrutiny as to whether it is reasonably appropriate to take that kind of action.

Senator FAIRCLOTH. Would you give me some of the tangents that we might have gone off on in the last 10 years—or have we gone off on any—and spent enormous amounts of tax dollars to protect against those carcinogenic materials or contaminants that have really proven to be not that dangerous and from a point of practicality were very impractical?

Ms. MATANOSKI. There have been many questions about chemicals, dioxin being one of them. We have put a lot of effort into dioxin and the actual impact on humans is not as well known as we would like to have the data for the present time. So in the chemical arena where we are extrapolating from animals and where we are looking at metabolic kinds of changes in the chemical before it actually takes its effect, we have a lot more questions as to whether we have gone off. Dioxin is one of them.

But where we have an impact like radiation where it breaks the DNA in your cells—and it does it in every single species I know of—it is a much more direct effect. Some of the other chemicals may be much more difficult to point to.

Senator FAIRCLOTH. PCB?

Ms. MATANOSKI. That is another one on which we have very little data as to the actual health effects in human.

Senator FAIRCLOTH. Or the life of it. What is the life of PCB?

Ms. MATANOSKI. It is permanent, practically, in the environment after it gets in there.

Senator FAIRCLOTH. We had a case in North Carolina, you might even be familiar with, where a manufacturer dumped thousands of gallons, from his plant, just to get rid of it up and down the highway, on the shoulders of the road. He dumped a lot of it. This was about 10 years ago. The State spent enormous amounts of money getting it up, hauling it off, storing it, and now they say that even where they put it is not enough to be dangerous. Yet we tore up shoulders of roads for hundreds of miles getting rid of it.

Would you say that was a waste of money?

Ms. **Matanoski**. It probably was, although right now we are still grappling with the problem of whether PCBs actually cause a change in the intelligence level of children. We haven't come down yet on the outcome of that one, so it may yet have been worth your while. But in the first flush of it, it probably was not.

Senator **Faircloth**. I am just saying that I don't want to see us get so that we find out how many carcinogens can dance on a needle point.

Ms. **Matanoski**. I agree with you about reasonableness. I don't know what we're putting into that.

Senator **Lieberman**. Thank you, Senator Faircloth. I think the dialog between yourself and Dr. Matanoski is an important one. I just want to assure you that it runs consistent with the kinds of questions that I have been asking here because I do think it is important to have a basis in science to the risk assessment that will generate action here. We all learn as we go along.

I must say personally that I am convinced, based on what these folks have said—including Dr. Matanoski, who is not rigid about her position—the state of the data here about radon is significant enough that it merits the kind of pretty balanced—the bill doesn't create a whole big new bureaucracy here. We're going to take it step-by-step as the facts indicate.

But as Dr. Godar said earlier, the consequences of lung cancer are so severe and the costs to society so great that even if you take the lower range of the estimates here, the action recommended by the bill is justified.

Let me ask just a couple more questions and then we will have to go on to the next panel.

Ms. Zielke, I appreciate your testimony in talking about the testing program for all schools. Obviously, we are dealing with the cost and whether we, as a society, can afford it. But I do want to ask whether in your experience you know of any particular air pollutant problems schools are experiencing and what steps they are attempting to take to deal with those.

Ms. **Zielke**. It is unfortunate, but sometimes the parents are the last to know. But we do hear from time to time about the use of pesticides sprayed in airtight buildings and what we are hearing certainly about the lack of good ventilation does to children. But many children are living in very airtight buildings today because of the way for energy purposes they are being tightened. And as we observe buildings that have been subjected to vandalism and windows are being bricked up or closed up with glass blocks, we can understand how problems are being created.

We have not been satisfied with notification to parents of the presence of and the status of asbestos and the care of that as the law even requires that parents be notified. So as we were hearing about the motivation that is needed for people to take care of the problem in their homes with radon, unless parents are really well-informed on these environmental issues, we don't see them coming into the schools and demanding to know. The schools are not taking the initiative to inform the parents, teachers, and staff in that school.

So it is a critical problem in how we deal with the environmental issues.

Senator LIEBERMAN. Dr. Lipoti, let me ask you one question. The Consumer Federation of America in its testimony on the next panel raises a concern that the radon disclosure provision in the bill in terms of the real estate transaction section may create a disincentive for the seller to test his home because in the moderate language of the bill we only require them to disclose any radon that they know exists, whether or not the home has been tested.

It is my understanding that New Jersey has similar requirements to the provisions proposed in this legislation. I wonder if there has been enough experience in New Jersey to indicate to us the effect of this provision. Have the disclosure provisions actually increased the rate of testing?

Ms. LIPOTI. There have been a number of things that have increased the rate of testing involved in the real estate transaction. Right now, in our highest radon potential area of New Jersey, 70 percent of the homes that are tested are tested during a real estate transaction. And that is without it being mandatory.

Senator LIEBERMAN. It is not required?

Ms. LIPOTI. This is just voluntary.

Senator LIEBERMAN. People are concerned about it?

Ms. LIPOTI. That is absolutely correct.

So we believe very strongly that even without a mandatory program we have had some success.

Senator LIEBERMAN. Thank you. That is good to hear.

Dr. Godar, this indoor air legislation provides that EPA will develop a list of indoor air contaminants and health advisories for those contaminants. One of the witnesses on our next panel, Dr. Cammer, raises some concerns that the public might receive misleading information about risks from these health advisories. Have you examined that part of the bill? Do you have any reaction to Dr. Cammer's concerns?

Dr. GODAR. Given that the public has hardly reacted at all to radon, I suspect they will not overreact to the concept of a contaminant. The average home has something like 50 aerosol products being stored somewhere, according to our surveys, many of which probably contain small amounts of known or suspected carcinogens.

Chemicals are being dispensed by industry, whether they are cleaners or solvents or other processors, at an alarming rate and many of the agents we know very little about. I think it is reasonable to indicate that there may be some risk, particularly if it is coupled with caution in terms of how they are stored. They need not be stored in the living area of a home. They could be stored where there is better aeration.

Perhaps that would address some of the concerns. The use of the word "potential" simply implies concern without perhaps iron-clad evidence that it is indeed a true carcinogen for man.

Senator LIEBERMAN. Thank you all. You have been a very helpful panel. We look forward to your continued involvement in this and we thank you again for your testimony.

I now call upon the third and final panel, Nancy Alderman of North Haven, Connecticut; Lynn Rhinehart is the occupational safety and health specialist with AFL–CIO here in Washington, D.C.; Dr. Paul Cammer is the president of the Business Council on

Indoor Air here in Washington, D.C.; and Ms. Mary Ellen Fise is with the Consumer Federation of America also here in Washington, D.C.

We thank each of you and will include your full statements in the record. We are going to continue to run the 5-minute clock. You bring a special perspective to this, which we appreciate.

It is a particular pleasure for me to welcome Nancy Alderman here. I would say that she is almost a life-long acquaintance, who by coincidence, unfortunately, has had some experiences which make her testimony here quite relevant. We thank you for making the trip and we look forward to your testimony now.

STATEMENT OF NANCY ALDERMAN, NORTH HAVEN, CONNECTICUT

Ms. ALDERMAN. Thank you.

My name is Nancy Alderman and I am from North Haven, Connecticut. I am a board member and past president of the Connecticut Fund for the Environment, a present board member of the Environmental Defense Fund, and a member of the Governor of Connecticut's Committee on Greenways.

I want to thank you for the opportunity to testify today on this important legislation and to testify on two indoor air pollution episodes that happened to me and the difficulty I faced in trying to resolve both of these problems without the benefit of having any kind of legislation in place pertaining to indoor air pollution.

Both episodes caused illness that came with the particular air pollution problem. And in both cases, the illness and symptoms disappeared shortly after the removal of the indoor air pollution problem.

The first episode involved a kitchen floor renovation in our home. The second episode involved the purchase of a new car 5 years later.

First, to address the household indoor air pollution problem, in the winter of 1977 we had a new linoleum kitchen floor installed. The floor was installed by covering the old linoleum with plywood and then gluing the new linoleum on top of this plywood. When the flooring company arrived with the plywood and the linoleum, I remembered noticing that the plywood had an odor. However, at that time I had never heard of indoor air pollution and I did not understand the significance of this odor.

When the floor installation was finished, my problems began. The air in the kitchen never felt the same again until we finally removed the floor.

When I was in the kitchen for a period of time, my eyes would burn and become uncomfortable. I noticed visitors in our kitchen experienced the same sensations.

At this time in 1977, I was simply a private citizen with no environmental background, no knowledge of toxics and their effect on the body. I could find no one who could enlighten me as to what was going on in my house. In fact, people responded to me at this time with comments such as, "I never heard of a house making anyone sick."

My symptoms increased from having just my eyes burn to swollen bronchial tubes. By this time, 2.5 months had elapsed and we were due to go away for 2 weeks in March. During this period away from my house the symptoms disappeared. When we returned, the symptoms returned and I became very concerned. As well, our younger child, whose bedroom is located at the top of the back stairs leading to the kitchen, was now beginning to have symptoms, including swollen sinuses.

Finally, in desperation I called a family friend who was an eye surgeon and asked him to come to our house and sit in our kitchen and help me problem-solve what was fast becoming a serious health problem. Dr. Jerome Friedman of New Haven, after spending just under an hour in our kitchen, said that we had to remove the kitchen floor and its plywood underlay.

Between in 1956 and 1958 he had been a United States Air Force flight surgeon and during that time he had a number of pilots who got sick every time they went up in their planes. He tracked their illness to their reconstructed oxygen masks that had used a glue that was causing the pilots to get sick. He said that when he got the masks replaced there were no further problems.

He did not know exactly what was used in the plywood or adhesive of my flooring, but that it didn't matter. He could tell that there was definitely an air pollution problem in our kitchen and we had to get rid of the cause. The cause was obviously the flooring.

Hearing Dr. Friedman's medical opinion, we removed our kitchen floor at a cost of $3,000 to us in 1977 dollars. Had we not been able to personally take that loss, I do not know to this day what we would have done. Although there was no way to get documentation in 1977, I am sure now that the problem was in the plywood. Plywood is put together with formaldehyde glue, and in 1977 there were no standards for formaldehyde in plywood and the plywood industry was not self-regulating itself in a meaningful way. We were unfortunate in that we had a bad batch of plywood installed in the kitchen that was out-gassing formaldehyde at a period of time when no one knew of such things or how to deal with them.

Besides the adverse health effects, need I describe what something like that does to the stress level inside a family? During part of this time when my symptoms became very uncomfortable and I wanted relief, I went and lived with my parents for a week. It was a very difficult time.

My second episode with indoor air pollution was very different and addresses the serious problems we have in some of our automobiles. Fortunately, I have all the documentation on this air pollution problem.

In 1983, we purchased a 1983 Malibu Chevrolet station wagon. We special ordered the car and when it came into the dealership we picked it up and paid in full, including the sales tax. The dealership is approximately 6 miles from our house. Between the time I got in the car at the dealership and the time I pulled into our driveway every mucous membrane above my neck was internally swollen. The car had a severe air pollution problem, of which I suspected formaldehyde from my earlier experience, but there seemed to be other things going on as well.

The first issue was what to do about the car. After leaving the windows open to let the "new car smell" out, I tried the car the next day. After 3 days, with the symptoms not improving, I called the car dealership to tell them that their car was making me sick. They told me that was impossible and that if I wanted to return the car I could, but that I would lose the sales tax as well as $1,500 because even though it only had 36 miles on it, it was now a used car.

Having a car I could not drive, not being able to return the car without losing thousands of dollars, and having a previous air pollution problem, and now being on the board of the Connecticut Fund for the Environment, I knew who to call for help in Connecticut.

In 1983, Alan Siniscalchi was the acting chief of the toxic hazards section of the Department of Health in the State of Connecticut. He told me that the State had just mandated that there were not enough funds to go out and test indoor air pollution problems that did not affect many people at the same time. However, even though this car was affecting just one family, because the Chevy Malibu wagon was such a popular car, he felt that the State could argue that the information gained from this car would be very valuable because in fact so many people own new Chevrolets.

So the State came and tested my car. I am therefore able to provide complete documentation of the air pollution that existed in this car and the seriousness of that pollution. At the same time, I can testify why the State was not able to remedy the situation, even though they thought this to be the utmost concern, and even though they genuinely wanted to fix this outrageous problem.

I am submitting the report in total with my testimony, but I will summarize the findings.

The car was out-gassing 10 times the limit of formaldehyde that the suggested Federal guidelines said that humans should be exposed. In 1983, the suggested guidelines for formaldehyde exposures in homes in Connecticut were at .03 parts per million. My car was 10 times the level at .4 parts per million. To quote the State's letter, "Adverse health effects were occurring among individuals exposed to formaldehyde at concentrations as low as .03 parts per million." Besides the very high levels of formaldehyde, the 1983 Chevrolet Malibu station wagon also had high levels of benzine, toluene, related M-xylene, and O-xylene, all neurotoxins. The State's letter described xylene and toluene as central nervous system depressants.

Now that I had documentation on the car, and this documentation proved that the car indeed had a severe indoor air pollution problem with the potential for adversely affecting human health, the car dealership would definitely not take the car back. They said that the car was defective and that they could never resell it. Because the car had a proven defect, the dealership would give me no money back for the car at all. They said that the issue was now between General Motors and ourselves.

We argued with General Motors from June until August in 1983 and only when I threatened a press conference, releasing the information on the air pollution problems in the Malibu station wagon did General Motors agree to take the car back and return our money.

But what about solving the larger issue? How do we fix all General Motors cars? Why should anyone be exposed to toxins at this level? As a private citizen, I could never get this problem solved.

Alan Siniscalchi told me just last week on May 16, 1993 that the State of Connecticut had considered this a major problem, but the State had neither the authority nor the resources to solve this problem. That is what is going to make this bill, S. 656, so important and why I cared enough to fly to Washington, D.C. at my own expense to testify today.

Using this example as a case study, let me briefly show why this problem could not fixed by me, a private citizen, and then why the State could not fix it, and then why this bill must pass so that people have the protection they deserve and the States have the tools they need to protect their citizens.

I first tried to solve the problem by calling Dr. Frosch, who was head of General Motors research division. I had a good friend was dean of the Yale Graduate School, and he sat on the board at Wood's Hole with Dr. Frosch. He was sure that Dr. Frosch was in a position to help fix the problems at General Motors as I described them.

I called him and explained that I wanted nothing other than to solve the indoor air pollution in General Motors cars. I told him that I had complete documentation on the problem and I would send them to him, which I did. He listened and ended the conversation.

A month later, I got a letter from the public relations department of General Motors telling me that cigarette smoke had formaldehyde in it. Because I do not smoke and because that had nothing to do with what I was trying to tell them, I knew it was hopeless.

I then tried the Center for Auto Safety in Washington, D.C. They said that their budgets had been cut and they did very little testing and what they did do had to do with accidents and not indoor air pollution. I was at a dead end.

Alan Siniscalchi at the State said that the State Health Department was shocked and surprised in 1983 to see the levels of neurotoxins and formaldehyde in the Chevy Malibu wagon. But because all standards were informal, the State could not force General Motors to look at their indoor air pollution problems. He said that without formal Federal guidelines for exposure limits, the States did not have the authority to effect change. This bill speaks to this.

The problem of indoor air pollution in buildings, homes, and cars is a major problem. However, it is one of our solvable problems. S. 656 goes a long way to solving the most pressing issues concerning this problem. If this bill does not get passed, you can multiply my two stories 1 million times, only most people will not be able to solve these problems and they will simply get sick.

The reason I say this is that the story of my car was published in the New Haven newspaper. When the story came out, I got more calls than I could handle from people who had similar problems, all of which I could not help. You are in the fortunate position of being able to help.

Thank you.

Senator LIEBERMAN. Thank you for that testimony. That was very powerful.

For the record, to the best of your knowledge, you are not chemically sensitive in any particular way, are you?

Ms. ALDERMAN. No, but I was told by the chairman of the School of Epidemiology at Yale that once you are sensitized to formaldehyde—I didn't have it over that long of a period—if we both sat in that Chevy Malibu and the light went on, my light would go on faster than your light, but I am not chemically sensitive. It is just that I have had an exposure. But I can sit in a room—although I don't like it—with new carpet. I don't like it at all, but I will not have a tremendously adverse reaction.

Senator LIEBERMAN. Whether you are chemically sensitive or not is of interest, but not conclusive here insofar as what you have told us is that the State found that the levels in the car were elevated way beyond what was acceptable.

Ms. ALDERMAN. Enormously so.

Senator LIEBERMAN. So regardless, I thought it would be interesting to have that information.

Ms. ALDERMAN. Also, the toluene was extremely high.

Senator LIEBERMAN. Thank you.

Let's go on now to Lynn Rhinehart from the AFL–CIO.

STATEMENT OF LYNN RHINEHART, OCCUPATIONAL SAFETY AND HEALTH SPECIALIST, AFL–CIO, WASHINGTON, D.C.

Ms. RHINEHART. Thank you, Mr. Chairman.

I appreciate the opportunity to be here today to discuss the AFL–CIO's views on this important issue.

With your permission, I would like to submit my full statement for the record and just highlight a few points today.

Senator LIEBERMAN. Without objection, your prepared statement will appear in the record.

Ms. RHINEHART. At the outset, I would like to let you know of the AFL–CIO's support for this legislation. We welcome the attention to the indoor air quality issue and the activities the legislation authorizes.

Indoor air quality is a big problem for workers across the United States. In fact, for some of our affiliated unions, indoor air quality is the occupational safety and health issue about which they receive the most complaints from their members and the most requests for assistance. There are a range of health problems associated with poor indoor air quality, which you have already heard about this morning, ranging from allergy-like symptoms to asthma to more serious and life-threatening diseases such as Legionnaire's Disease.

You may recall the incident a couple of years ago at a Social Security Administration building in Richmond, California where a worker died and several other workers were made ill from Legionnaire's bacteria being transmitted throughout the building's ventilation system. That incident is not an isolated incident. Legionella have been found in other building ventilation systems across the United States.

An emerging indoor air threat is tuberculosis. There have been incidents in New York, Miami, and other areas of the United States where health care workers have contracted tuberculosis because of bacteria being transmitted through the air from TB infected patients.

In addition to the health problems that poor indoor air quality can cause, poor indoor air is responsible for a significant loss in worker productivity. EPA has estimated the cost of lost productivity and medical expenses to be in the range of tens of billions of dollars per year. Surveys taken of workers find that anywhere between 25 percent and 50 percent of the workers surveyed report taking at least one day off from work each year due to problems they associate with poor indoor air quality. So we are clearly talking about a major impact on worker productivity and related expenses to workers, employers, and our society as a whole.

Because of the range and scope of the indoor air quality problem, we really strongly believe that action is needed to bring about greater understanding of the causes and effects of poor indoor air quality, as well as greater efforts to address these problems. The provisions in the legislation authorizing a broad research program on indoor air quality, a Federal response plan, a variety of technical bulletins, as well as a Federal building program are all provisions that we think will move things forward in this important area.

I would like to stress that we strongly support the demonstration program that the bill establishes for the National Institute for Occupational Safety and Health. NIOSH is the Federal agency that is primarily responsible for research in worker safety and health. They have conducted hundreds of building assessments looking at indoor air quality problems and have helped both to identify the causes and recommend some solutions to indoor air quality problems.

This has been invaluable to our members and non-union workers as well in trying to seek relief from indoor air quality problems. We welcome the legislation's authorization of greater activities in this area.

I would like to emphasize that worker exposures are a very important part of the indoor air quality problem. Workers may well be the population most exposed to bad indoor air. The Federal efforts in this area have been lacking to date and that is why we are hopeful that this legislation will provide greater relief.

The Occupational Safety and Health Administration, which is the agency established by Congress to protect worker safety and health, has done very little in this area. For this reason, the AFL-CIO and 14 of our affiliated unions petitioned OSHA to set regulations on indoor air quality in the work place. We would like them to set regulations requiring employers to basically make an assessment of the various factors in the building that may contribute to bad indoor air and to have a plan for addressing those various factors.

With your permission, I would like to submit our petition as well as some draft regulations currently being developed by the State of Washington as examples of remedal measures being contemplated in this area.

We would support the addition of language in S. 656 directing OSHA to proceed to regulate in the area of work place indoor air quality. Congress has taken such action many times in the past with respect to occupational health hazards, most recently in the Housing Bill, which the Congress passed during the 102d Congress. In that bill, Congress directed OSHA to set lead standards for construction workers. We would welcome a similar mandate in this legislation for OSHA to act in the area of work place indoor air quality.

We think this is an area where we certainly can use more research, but we also think that there are practical solutions available right now to alleviate indoor air quality problems in many buildings. My written statement has summarized actions taken in a number of buildings across the United States, some of which are in your State of Connecticut, where unions have been able to get employers to take actions ranging from minimizing chemical exposure to maintaining the ventilation system to simply increasing the air flow in a building. These basic steps oftentimes will go a long way in alleviating the health problems that workers are experiencing from poor indoor air quality.

Senator LIEBERMAN. Let me ask you about those. I was interested in those cases from Connecticut.

How were they discovered? And what was the process by which the workers convinced the management to make the changes?

Ms. RHINEHART. In most cases, the situations were brought to the attention of the service employee's union that represented the workers in those facilities. The union would conduct a survey of the workers at the work place to see what the problems were, come in and do a building assessment to see what sorts of things might be leading to the problems. They would then sit down and negotiate with management over remedial actions that could be taken. I can provide some additional cases and details on those cases for the record.

Senator LIEBERMAN. I am curious about what kinds of changes had to be made. Were they substantial building renovations or relatively minor?

Ms. RHINEHART. In the cases in Connecticut, they were relatively minor. In some cases, major renovations are needed. For example, there is a situation with a Department of Transportation building in Maine where the workers have been suffering from serious problems relating to the indoor air and the State has committed to basically a complete redesign and overhaul of the ventilation system. Obviously, that is a pretty expensive endeavor.

But with the cases in Connecticut and in Massachusetts, actually it was just a matter of putting better sealant in the floor to keep chemicals from seeping up from industrial operations that were going on in the stones below, and simply increasing the air flow in the building. So those were fairly minor renovations.

Senator LIEBERMAN. Did you have anything more you would like to say?

Ms. RHINEHART. I would just like to conclude by saying that we support this bill and are very pleased to hear that the administration is on-board. We are hopeful that the legislation will move forward in this Congress.

Senator LIEBERMAN. Thank you very much.

Dr. Paul Cammer is the president of the Business Council on Indoor Air.

We thank you for being here and look forward to your testimony.

STATEMENT OF PAUL CAMMER, PRESIDENT, BUSINESS COUNCIL ON INDOOR AIR, WASHINGTON, D.C.

Dr. CAMMER. Thank you, Mr. Chairman.

My comments will be directed primarily at S. 656 this morning.

We do agree with the bill's sponsors that providing high quality indoor air is extremely important and also that a lot of improvement can be made in this area. We also agree that increased funds for research should be identified.

However, we disagree that S. 656, as it is currently crafted, is a good method for achieving the results we all seek. Not only do we think adequate authority already exists for regulating indoor air contaminants, but the bill, as written, could actually be counterproductive, vis a vis, programs already in place.

This morning, Congressman Kennedy was describing the problems in one of his buildings. I thought his comments were right on target and that in many cases fixing and maintaining a building's air handling and filtration systems will resolve the problems of sick buildings. A 1988 study at the Walter Reed Army Hospital showed that the rate of respiratory infection in modern airtight buildings was 50 percent higher than the rate in less modern and less airtight buildings.

We agree with EPA this morning when they said that an integrated building systems approach is the way to go to improve indoor air quality. It is without a doubt the most efficient and effective method of improving indoor air quality as compared with a pollutant-by-pollutant approach.

BCIA's blueprint for good indoor air has a variety of elements, some of which are:

Minimum ventilation rates, and by that I don't mean just an overall building ventilation rate. You can have a ventilation rate on the outside perimeter of a building where it is 30 cfm and only 5 cfm in the middle—in which case all the people in the middle are getting inadequate indoor concentrations of outdoor air. Also, there has been a paper published recently in the New England Journal of Medicine by some researchers at McGill University that has been cited as an explanation for why ventilation does not improve indoor air quality.

In our written testimony, there is a chart that shows the data from the ASHRAE appendix that shows exactly why ASHRAE, in the 62–1989 standard, set 20 cfm: because you get most of your benefit from ventilation in that first 20 cfm. Beyond that, you do not see as much benefit. It is that outer range where those researchers were looking at ventilation and where its effectiveness is minimal. Consequently, you would not expect to see a reduction in complaints.

The second element: we strongly believe that proper use and maintenance of filtration systems is critical and is not being done at this point in time.

Third, annual inspections of air handling equipment.

Fourth, if necessary, localized management of sources. For example, Congressman Kennedy raised the issue this morning of odor from installed carpet. I thought that was an interesting example, but there are a lot of other examples where people are painting in office buildings, especially in Washington and cities like this where offices are constantly moving from one location to another; you have situations where people are exposed to the drywall that is being sanded, carpet that is being installed, walls that are being painted, walls that are being covered with wallpaper. There is a lot that you can do on localized ventilation or just on the timing of the situation. Why do it on Monday morning when you can do it on Friday afternoon and have increased ventilation over the weekend and take care of the problem that way?

We strongly support the ASHRAE 62–1989 standard that does raise the recommended ventilation rate from 5 cfm to 20 cfm.

Let me now turn to a couple of specific provisions of the bill. We do agree with the aspects of the bill that provide a coordination of research and other activities. We believe, in particular, that more research is needed in the areas of engineering techniques and biological contamination, two subjects that have not traditionally been on EPA's research plate.

We have long recommended a healthy building study that would look at what a healthy building is and what a sick building is so that we have a baseline for a comparison. You have to remember that just the presence of low-levels of substances in the air doesn't automatically signal a health impact. With safety, we also have to have a strong balanced approach.

Since I see that the yellow light has come on, let me turn to the health advisories, since you brought that up this morning.

Yes, we are concerned about the health advisories. We are very concerned about them. It is not that we don't think that the public shouldn't be informed about certain things. Dr. Godar's response—the kinds of things he was explaining—were exactly the kind of things that we should be communicating to the public. That is, to a great degree, being addressed in the guideline documents that are already underway at EPA's Indoor Air Division.

However, if you sidetrack that Division and other parts of EPA toward doing health advisories that are essentially quasi risk assessments, we are concerned about the resources that will take, but we are mostly concerned about the standard of scientific quality that will go into them.

The bill calls for these health advisories to be based on "the most current available scientific and related findings or information." The most current information is not necessarily in step with the overall weight of the evidence.

So if you are going to do essentially a quasi risk assessment, we must have a high standard of scientific excellence that must be adhered to and a process for review and comment. There are a lot of things we are concerned about.

Senator LIEBERMAN. You would feel better about the health advisories if we altered that standard for the level of scientific evidence available?

Dr. CAMMER. I would feel much better. I followed the health advisories under the drinking water situation extensively over the years, and I used to be at EPA working on these documents. It is not that we shouldn't communicate with the public, it is just that the task of risk communication is not one that has been dealt with very well over the years.

We talked about asbestos. The public has become very concerned in situations about asbestos. Then you have the other situation about radon where they really haven't become concerned. Why is there this difference? They do become very concerned sometimes about things unjustifiably and then sometimes they are not concerned enough.

I think there is a problem in the risk communication that the Federal Government undertakes. It needs significant revision and improvement, perhaps along the lines of what Senator Moynihan is working on.

Senator LIEBERMAN. In terms of science-based, yes.

Let me ask you to respond to the other part of Dr. Godar's response to this, that EPA has at different points raised their voices quite loudly about the dangers of radon and the public for awhile was concerned and then seems not to have really responded very much to it.

I think he was saying that if that is the case, how can we truly be concerned that there will be an overreaction to the health advisories?

Part of this is a question of how information reaches the public, which is in itself the subject of another hearing. The average health advisory, unless it is really extreme, is not going to make it on the evening news. It is probably going to find a hard time reaching any but a very small group of the population.

Dr. CAMMER. I guess I disagree with that analysis. I think there will be situations where that does happen where EPA says something and nobody pays attention to it. I think there will be a lot of situations where the health advisory will have a profound impact on the marketplace. It all depends, perhaps, on the news media and what they might say about it. The alar situation—things can really get blown out of proportion at times.

If that has a profound impact on the public's buying patterns and their use patterns, it will therefore have a profound impact on the marketplace. If we are going to issue documents that have this potential, we need to make sure that they have a strong basis in fact and not just the "most current available information".

We must make sure that the assessment is solid all the way around. That is really what we're saying.

Senator LIEBERMAN. So your concern is not that the typical one will create the problem, but you are fearful that a conclusion not based adequately on science but in an area or nature that will be inherently newsworthy will be issued, and then there will be a public flurry about it?

Dr. CAMMER. That is one of the concerns.

There is another major concern, and that is that State and local agencies many times in the past have taken documents and situations that EPA has not intended for regulatory purposes and turned them directly into regulatory actions. For example, the carcinogen classification system. If you ask EPA how they intend that to be used, they will say it is just a comparative system. Then if you go into a lot of the States and local jurisdictions, they take those classifications and incorporate them directly into regulations.

I think that is also something. The public may not even know this is happening.

So if this is going to be the foundation of action—and I do believe that they would be the foundation of action, otherwise, why do them—I think they should go through a significant process to make sure that they are accurate and well-founded in science.

That is all.

Senator LIEBERMAN. I interrupted you. Do you have anything further?

Dr. CAMMER. I would like to comment on the response plan briefly and the phrase "protective of human health".

The concept doesn't disturb me whatsoever. I believe in it. The phrase inserted here in this particular bill leads us to believe that it may conflict with other standards that are used in other statutes. If you are going to say that you must use other statutes to enforce and regulate down to the level that is identified in the health advisories, presumably, to a level that is protective of human health, you will see conflicts, I am sure, in the interpretations of TSCA and other areas.

We think that those two areas need significant revision. I am not saying that they cannot be revised, but I am saying that as it is now crafted, it gives us heartache.

Thank you.

Senator LIEBERMAN. Thank you.

Finally, Ms. Mary Ellen Fise of the Consumer Federation.

Thank you for patience and thank you for being here.

STATEMENT OF MARY ELLEN FISE, CONSUMER FEDERATION OF AMERICA, WASHINGTON, D.C.

Ms. FISE. Thank you.

As a baseball fan, it is a pleasure to be the cleanup hitter this morning.

[Laughter.]

Ms. FISE. I want to thank you, Mr. Chairman, for your leadership on these issues as well as to acknowledge this morning the work of Senator Mitchell and Senator Lautenberg in addressing the indoor air and radon issues.

I would like to ask that my full statement be put in the record and note for the subcommittee that CFA's testimony also addresses S. 657, the Indoor Radon Abatement Reauthorization Act.

Senator LIEBERMAN. Without objection, your prepared statement will appear in the record.

Ms. FISE. We are pleased to discuss the indoor air legislation today. It is an issue that CFA has been concerned about for the past 12 years, and others seem to agree. As it was noted earlier today, reviews of environmental hazards facing consumers have consistently ranked indoor pollution as a serious risk. EPA's own comparative risk assessment concluded that indoor air pollution was ranked fourth of the 29 problems examined.

When the three EPA regions looked at these problems, they also found indoor air to pose a high risk, as did the EPA Science Advisory Board. The SAB concluded that due to the large population directly exposed to a number of agents, some of which are highly toxic, this problem causes a relatively high human health risk.

Interestingly, although not surprisingly, a summary ranking of environmental problems by the level of the public concern places indoor air pollution in a much lower category in terms of the public's perception of risk. I would say that with the exception of ETS and radon, it has been our experience that until consumers themselves suffer fairly severe acute symptoms, they know relatively little about indoor air quality.

I think Ms. Alderman's testimony today really underscores that fact.

And as others have noted, today, indoor air pollution is very costly to our society. For these reasons, CFA enthusiastically supports S. 656.

In addition to institutionalizing the EPA's indoor air program, this legislation provides important funding authorizations for the indoor air program. With a current budget of $3.8 million and just 17 staff people, it is clear that despite the findings that indoor air is one of the most serious health risks within EPA's jurisdiction, the indoor air division is currently understaffed and under-funded.

CFA believes that the cornerstone provisions of this legislation are section 7 and 8 on the indoor air contaminant health advisories and a national indoor air quality response plan. The development of the health advisories is an important step forward in protecting the public health and will provide a useful base of information in a consistent format for consumers and others.

I would like to note that many of the contaminants identified to be the subject of health advisories are ones that have been the subject of government scrutiny for years and years, and in some cases over decades.

The national response plan will create a road map for both the public and private sectors in addressing indoor air pollutants. It also can serve as a checklist for Congress to assess the actions of Federal agencies in meeting their congressionally mandated responsibilities under existing statutes; and if need be, will help identify areas where additional legislation may be called for.

The section of ventilation standards in the bill is another key component. Assessing the effectiveness, feasibility, and cost of various control technologies is critical to determining indoor air solutions.

As a consumer organization, we are particularly concerned that the various products and services being offered to alleviate indoor air complaints are in fact effective. Consumers don't have the ability to evaluate these products' efficacy and thus they may be more vulnerable to misleading indoor air marketing claims. Because of this concern, we recommend that this section of the legislation explicitly include consumer products marketed to reduce or eliminate indoor air effects.

I brought along this example, which was in a catalog aimed at parents. The whole catalog includes child-proofing products and other things to protect children. There is a product advertised, which I really don't know whether is a good product or a bad product. But the headline here in capital letters says, "The Most Efficient Portable Air Purifier Removes 99.97 Percent of all Air Contaminants."

I only have a little bit of knowledge—I am not a scientist—but I find that assertion hard to believe. But if you are a consumer and your family is experiencing some problems, you may be enticed to buy this $295 product.

We are similarly pleased to see that section 8 of the legislation requires an assessment of monitoring and mitigation services, including the reliability and accuracy of such services and a review of oversight options, whether it be registering people, licensing, or certification. We believe that this is important because consumers are technically unable to determine if they have an indoor air pollution problem unless they are, of course, suffering very acute symptoms. Or if indoor air mitigation work has been done, has it been done properly?

We also believe that the assessment of the adequacy of current building ventilation is very important and we believe that a study should also include the evaluation of enforcement authority and enforcement mechanism to assure compliance with adopted standards.

We also strongly support the indoor air quality clearinghouse and we are pleased that EPA has already begun to have such a service. After being in operation just 7 months, the clearinghouse hot line is averaging over 1,500 calls per month. While we believe this is a relatively low rate for a consumer hot line, we would expect that this number would greatly increase if it receives increased nationwide publicity and promotion. Having a source to call for reliable information is very important to consumers, particularly on indoor air since there is little consumer knowledge and there is confusion about what action to take.

Finally, we would urge the subcommittee to help assure that adequate funds are in fact appropriated if this bill becomes law. We also believe vigorous oversight by your subcommittee will be in order to assure that indoor air quality does become a priority issue at EPA and that the legislation is carried out in a timely fashion.

Thank you.

Senator LIEBERMAN. Well said. Thank you.

Since you supported the health advisories, let me ask you to respond more specifically to what Dr. Cammer said and his concerns about the program.

Ms. FISE. I think if you look back at what the Government has been doing in terms of different agencies that have looked at indoor air pollutants, there is a lot of information there. There have been recommendations made about levels, about what types of effects consumers or others experience. Yet there is a lot of information that hasn't been disseminated.

It is hard for all of us to sit here and ask, Will the public get scared and run off and do things that we didn't anticipate or want them to do? We can only guess as to how they will use that information.

I know that we get letters at CFA concerning a whole range of consumer reactions. Some of the letters are suspicious about particular products, and some just say that they are having these horrible symptoms and ask what to do about it. We don't have a lot to tell them. Thus far, the Government hasn't really been giving out a lot of that information. I think the health advisories would be a really important step forward in creating a base of knowledge.

In terms of what language is used and what the burdens are on EPA, I think many of other statutes use language like "best available technology" or similar language.

It really comes down to, I think, a decision of, Do we want to wait years and years until every last piece of information and every possible study has been done 10 times over before we start giving people information? Maybe you don't go to the point of regulating every single one of these that ends up in a health advisory, but certainly giving people information so that they can determine if they are buying a new product whether they want to get that product if they suspect there may be some sensitivities.

We think providing information is a very reasonable approach.

Senator LIEBERMAN. Dr. Cammer, I would be interested in your reaction to that, but also I would like to ask you, Are you at all reassured by the fact that the health advisories are open to public review and comment and that the Science Advisory Board is authorized to comment on them to EPA, presumably before they are issued?

There are some checks here on some of the concerns that you have.

Dr. CAMMER. There are some. To that extent, it is useful. I know you have been following the raging debate on risk assessment. So it is not just that we need to do things as we always have been. I think the climate in the scientific community is changing, and therefore at EPA; that maybe something that is an animal carcinogen may not be a human carcinogen. If we know a little bit more about it, we can explain that.

How you explain that to the public is a difficult task and not one that shouldn't be undertaken automatically. I am saying that it is a task that is difficult. Because it is difficult, you need more checks and balances. And because it does have an impact on the marketplace, as Mary Ellen just pointed out, people will change their buying habits. Sometimes that could also be counterproductive. They will move to something that is not as well tested or maybe not even tested at all.

It is just a situation that we have to be careful about. There are movements in the Senate to do that and there are movements in the EPA to change the risk assessment situation, and that is it.

On the item about the filter that Mary Ellen was mentioning, I happen to know a little bit about that particular one because my son, while he is only 4 years old, for as long as I can remember has been coughing and sneezing. So we took him to a pediatrician and she told me that we needed to take him to an allergist. We took him to a pediatric allergist and he said, "We have run all these tests and we can't find him positive for any of them, but buy this item here. It is the only thing on the market that works."

It turns out that it looks like the same machine with a HEPA-filter, which is about the only filter that will take out 99.97 percent of 0.3 microns or larger. It also has zeolite in it, which takes out VOCs.

Senator LIEBERMAN. And it works?

Dr. CAMMER. Yes, it is about the only thing on the market that does work.

Senator LIEBERMAN. Is your 4-year-old better?

Dr. CAMMER. He seems to be better, but it has only been in there for about 3 months. We put it in his bedroom and keep the door closed so that at night he is breathing a lot cleaner air than he used to be.

Senator LIEBERMAN. I have two of my colleagues that I happen to have run into in the Senate who are from Western States, both of whom suffer terribly here in Washington. It could just be service in the Senate that is doing it to them——

[Laughter.]

Senator LIEBERMAN.—but they think that it is allergies. Of course, I wonder whether it is indoor air pollution, but it is probably more likely allergies here.

Ms. Fise, did you have something to add?

Ms. FISE. Dr. Cammer was talking about the information in these health advisories and following up on my discussion of providing information to consumers. But I think that another benefit will be that the information will be available to everyone, including people that are going to be making consumer products, or making products that are used in work places and what have you.

I think the health advisories will provide guidance. In addition to just informing consumers, it will create a base of knowledge that people will have in the manufacturing world also.

Senator LIEBERMAN. This anticipates my final question.

Much of the indoor air legislation that we're talking about here involves the dissemination of information about how you can determine what the quality of the air is that you are breathing and how you can reduce it.

There are some who feel that we should go beyond that and begin to label products that may be contributors to indoor air pollution as a warning. I wonder what any of you think about that. Is that a good next step or additional step to take? I'm thinking about heaters, stoves, and some of the cleansers that are used in homes.

Ms. FISE. In some cases, that is already done for some products voluntarily. I think that you have to look at the range of policy options. For example, on formaldehyde the Government could set a limit and say that no piece of particle board or pressed wood is going to emit formaldehyde above a certain emission rate.

Senator LIEBERMAN. Right.

Ms. FISE. Or a step down from that would be a requirement that manufacturers disclose what rate of emission their board meets. We have heard from the industry for example, that there are high emitting products and low emitting products.

Or at an even further step down would be a statement, for example, that formaldehyde is a problem for some people and include a very general type of warning. I think that what you are suggesting is that there is a range of alternatives to protect the public.

CFA is on record as supporting regulatory action on some specific pollutants because we believe that the public needs to be protected. But at least giving people the information, so that if they wanted to choose a less polluting products, would certainly help them in the marketplace.

Senator LIEBERMAN. Dr. Cammer, generally speaking, who are the members of the Business Council? Is it people who build buildings or manage them? Or is it the producers of the products that might be subject to a labelling regulation?

Dr. CAMMER. Actually, it is mostly all of the above. We have an odd consortium of companies including basic chemical producers, producers of products, engineering firms that do nothing but analyze indoor air, other firms that make filters that clean indoor air. It is just an odd consortium of companies.

Senator LIEBERMAN. Thank you.

Again, I thank the people on this panel for taking the time to come in. I think you came further than anybody else—not that North Haven is that far from Washington, D.C.

The record of the hearing will remain open for 2 weeks for additional questions and any statements that the witnesses or anybody else would like to submit. I remain convinced at the end of the hearing that this is an area where there is sufficient evidence to justify concern about impact on health and that these two bills are quite balanced and measured. I hope that we can act on them in this session.

I thank you all. The hearing is adjourned.

[Whereupon, at 12:50 p.m., the subcommittee was adjourned, to reconvene at the call of the Chair.]

[Statements submitted for the record, responses to additional questions, and the bills, S. 656 and 657 follow:]

STATEMENT OF HON. JOSEPH P. KENNEDY, II, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF MASSACHUSETTS

Good morning. First of all, I would like to thank Chairman Lieberman and the other distinguished members of the Subcommittee for calling this hearing on the Indoor Air Quality Act of 1993. I am also pleased to see Senator George Mitchell, the bill's sponsor, and Senator John Chafee here today, both have been strong advocates for this legislation.

Senator Mitchell has shown tremendous leadership in tackling this serious public health matter. He has been successful in achieving overwhelming support for this legislation in the Senate with Senate passage for the last two Congresses. I have been privileged and honored to work with the Senator in sponsoring similar legislation in the House. This year, I hope to achieve the same level of success—with House passage.

Mr. Chairman, we all take for granted the air that we breathe, particularly the air we breathe indoors. I want to dispel the myth that "what you can't see can't hurt you"—IT CAN. Twenty times every minute the average person takes a breath without realizing what they have just inhaled or what possible health effects may come about. Yet, 9 out of 10 Americans are inhaling contaminants that have been identified by the EPA and the scientific community as serious health risks.

Long-term health effects, including respiratory diseases and cancer, can be debilitating or even fatal. These contaminants may cause as many as 20,000 radon-related deaths in addition to 6,000 deaths from cancer each year. In addition, inhalation of contaminants accounts for hundreds of thousands of complaints of immediate effects which may include: asthma, bronchitis, headaches, fatigue, dizziness, and nausea. Of the calls to the National Institute of Occupational Safety and Health's (NIOSH) complaint hotline, more calls were received about indoor air—1,710 to be specific—than all other work environment complaints combined. Since Americans spend 90% of their time indoors, indoor air problems present a *major* environmental public health threat.

The human health toll is significant. In fact, EPA and its independent Science Advisory Board have consistently ranked indoor air pollution as one of the top five environmental risks to health, ahead of hazardous waste and outdoor air pollution.

But, these are not the only costs to society. The costs are also economic. In its 1989 Report to Congress, EPA estimated that *indoor air pollution costs tens of billions per year* in direct medical costs; lost worker productivity; decreased efficiency while on the job; and equipment damages due to indoor contaminant exposure. In a service economy, the single largest components of expenditures are salaries and benefits. The costs to American businesses cannot be tolerated.

The Indoor Air Quality Act of 1993 sets out to meet our responsibility to protect and inform Americans of unseen dangers in the air that we breathe everyday. The first goal of the bill is to improve our knowledge about the causes and effects of the indoor air pollution. EPA will establish a coordinated and comprehensive federal research, development, and demonstration program to improve indoor air quality. It calls for the assessment of the sources of contaminants and their effect on human health, and the development of methods to reduce exposure to indoor air contaminants.

It also requires a national assessment of schools and child care facilities to determine the seriousness and scope of indoor air problems. Radon alone is an enormous problem in our nation's schools. A recent EPA survey of 1,000 schools showed that 1 out of every 5 schools had radon levels above the federal action level requiring reduction. Nationwide, EPA estimates that over 70,000 schoolrooms may have excess radon levels. Yet, radon is but one of the numerous indoor air contaminants that we must contend with.

More and more we are coming to realize the extent to which schools are plagued with indoor air problems. In fact, concerned teachers and parents of students from the Cambridge Rindge and Latin High School in my district initially brought this issue to my attention. Dozens of otherwise healthy teachers and students were being sent home with complaints of respiratory illnesses, fatigue and headaches. Students with medical histories of asthma and bronchitis treated by medication, could no longer attend classes. This was not another ordinary case of the flu but rather an inadequate ventilation system coupled with contaminants from new construction in a part of the school. The fact is, the problems in schools represent only a fraction—albeit an important fraction—of a far-reaching national problem. We must take the comprehensive approach to indoor air quality called for in this bill.

Central to the bill are provisions for the development of management practices to address indoor air contaminants and the publication of health advisories. The health advisories will provide the public with practical information about the risks of certain indoor air pollutants including the levels that require action.

EPA together with other federal agencies will also design and implement a national indoor air quality response strategy to indoor air quality problems. It will include information dissemination programs, educational programs, and options (both private and public sector) for providing technical assistance. An Indoor Air Quality Clearinghouse will be established, featuring a toll-free telephone hotline so that concerned individuals have place to turn when they have problems or questions.

In addition, this legislation includes provisions to protect scores of federal workers through a building evaluation and remediation program.

The bill gets these initiatives out to communities by setting forth a state and local grant program. States can devise management strategies and response programs that best meet their needs in reducing indoor air pollution.

The Indoor Air Quality Act of 1993 has widespread support and is backed by groups such as the American Lung Association, the Consumer Federation of America, the AFL-CIO, and the National Parent Teachers' Association (PTA). Many of these groups are here to testify today.

Mr. Chairman, this is one of the rare instances where we have been ahead of the curve—calling up front for public information and better research to find intelligent solutions to indoor air problems. The time has come for indoor air quality legislation. Waiting costs money. Waiting takes a toll on public health and the economy. We simply cannot afford to wait any longer to confront such a serious health menace. With our national commitment to health care reform and economic growth, investing in indoor air quality makes tremendous sense, especially given the expected returns on investment.

I look forward to a stronger environmental record with the new Clinton Administration and to support from the White House in promoting indoor air quality.

Again, I want to thank the Subcommittee for its leadership on this issue. I believe that today's testimony will reinforce the need to act expeditiously to address indoor air pollution through enactment of the Indoor Air Quality Act of 1993. With the

Subcommittee's continued support and leadership, we can put in motion cost-effective means for addressing a top environmental health threat this Congress. I look forward to working steadfastly with you toward that goal. Thank you.

TESTIMONY OF HON. ROBERT SUSSMAN, DEPUTY ADMINISTRATOR, ENVIRONMENTAL PROTECTION AGENCY

Mr. Chairman, members of the Committee, I am pleased to be here today to testify on the Environmental protection Agency's (EPA) indoor air quality and radon programs, and to comment on S. 656, the Indoor Air Quality Act of 1993, and S. 657, the Indoor Radon Abatement Act of 1993. Indoor air quality is one of the most important emerging issues on the Agency's agenda. Comparative risk studies performed by EPA and its Science Advisory Board have consistently ranked indoor air pollution, including radon, among the top four environmental risks to public health.

To date, two pieces of legislation have guided EPA's indoor air and radon programs. Title IV of the Superfund Amendments and Reauthorization Act of 1986 laid the foundation for EPA's indoor air quality research program and dissemination of information and solutions. It also provided initial direction for the Agency's radon problem assessment activities and radon mitigation research program. The 1988 Indoor Radon Abatement Act (IRAA) expanded EPA's radon program by establishing authorities to develop training centers, provide assistance to States, and conduct other important efforts.

EPA's overall approach toward indoor air has been to recognize that, while there is still much that we do not know about the impact of the indoor environment on human health, we can nonetheless achieve significant improvements now by incorporating pollution prevention approaches into the design, construction, maintenance, and operation of buildings, and by managing pollutant-specific risks when we know about them. EPA has found that practical, common sense solutions can often minimize indoor air quality problems.

With respect to the 1988 IRAA, EPA has made significant progress in areas such as: educating the public, conducting surveys, developing mitigation technologies and radon-resistant building features, and working with major science organizations to further refine health risks. Further, EPA is conducting extensive public outreach activities with various national nonprofit organizations, including the American Lung Association, the Consumer Federation of America and the National Association of Counties.

The bills before you, S. 656 and S. 657, are largely consistent with the current direction of EPA's programs. We support the thrust of these bills, and believe they would constructively augment existing EPA programs. I will begin by outlining the Agency's indoor air and radon action programs, then turn my attention to S. 656 and S. 657.

Scope of the Indoor Air Quality Problem

Awareness of indoor air quality as an environmental issue is relatively new. Indoor air pollutants, which include environmental tobacco smoke, radon, and other chemical and biological contaminants, can cause long and short term health effects, especially when inadequate ventilation allows indoor concentrations to increase. EPA studies of human exposure to air pollutants indicate that indoor levels of many pollutants may be 2–5 times, and occasionally 100 or as much as 1,000 times, higher than outdoor levels. These levels of indoor air pollutants are of particular concern because we estimate that most people spend as much as 90% of their time indoors.

Over the past several decades, our exposure to indoor air pollutants is believed to have increased due to a variety of factors, including the construction of more tightly sealed buildings, reduced ventilation rates to save energy, the increased use of synthetic building materials and furnishings, and the increased use of chemically formulated personal care products, pesticides and cleaners. EPA, in close coordination with other Federal agencies and the private sector is making a concerted effort to better understand indoor air pollution and to reduce people's exposure to air pollution in offices, homes, schools and other indoor environments where people live, work and play.

Studies that have been conducted to date by EPA, other Federal and State agencies, and the private sector have led to the concern that people are exposed to levels of pollutants indoors that may be significant in terms of long term risks of cancer and other chronic effects; thus the very high ranking for indoor air in many of the recent relative risk reports prepared by EPA and, most recently, by the Agency's Science Advisory Board. Our level of understanding about these risks, however, is limited except for relatively few pollutants, most notably radon, lead, environmental tobacco smoke, and asbestos. For example, EPA estimates that between 7,000 and 30,000 lung cancer deaths (best estimate is 14,000) in the United States are attributed to radon exposure. EPA recently reported that an estimated 3,000 lung cancer deaths in non-smokers and serious respiratory health disorders in children are caused by exposure to environmental tobacco smoke. Lead has been shown to cause mental impairment in children and asbestos is a documented cause of lung diseases. For asbestos, radon and lead, the Agency has undertaken major risk management programs, and we are engaging in a public education program to reduce exposure to environmental tobacco smoke. The long term risks associated with exposure to other indoor pollutants, however, are not as well-characterized or understood.

Even less well understood are the more immediate effects of exposure to indoor contaminants in buildings. There appears to be an increasing number of health complaints associated with poor indoor air quality in the nation's public and commercial buildings, schools, residences, and other non-industrial buildings. These complaints can involve a variety of symptoms such as eye, nose, and throat irritation, headache, lethargy, dizziness and other symptoms for which specific causes cannot be identified and which have come to be known collectively as "sick building syndrome." While a number of hypotheses have been advanced to explain sick building syndrome, including exposure to low levels of individual or mixtures of volatile organic compounds (VOCs), most researchers believe that there is no single explanation, but rather that occupant perceptions of air quality indoors can be impacted by many factors which are often difficult to sort out. These factors include exposure to a variety of chemical and biological contaminants; comfort factors such as temperature and humidity; ventilation (outside air supply and air movement); lighting; noise; odor, which has a very strong perceptive influence; and psychosocial factors, including job stress and environmental aesthetics.

At the same time, there are a number of illnesses which can be directly and demonstrably related to environmental pollutants in buildings, ranging from well known and life-threatening illnesses such as carbon monoxide poisoning, Legionnaire's disease, and tuberculosis, to a variety of specific acute reactions such as irritation from formaldehyde or allergic reactions to biological contaminants.

Finally, there are emerging and highly controversial health concerns, such as the phenomenon of multiple chemical sensitivity (MCS), in which a segment of the population believes that their acute exposures to individual chemicals, or mixtures of chemicals, or perhaps even repeated exposure to very low levels of chemicals, have resulted in a heightened sensitivity to many chemicals which they are exposed to in their day-to-day lives. While the cause or causes of their health problems are still the subject of much debate, there is no question that these people's lives are being affected in devastating ways.

In sum, understanding the health impacts of indoor pollutants on occupants whose age, physical status, and susceptibility may vary greatly, is a complex issue which presents a distinct research and public policy challenge.

Efforts to estimate both the costs of indoor air pollution to society, as well as estimates of the costs of controlling indoor air pollutants, are in their infancy. An initial effort by EPA to estimate the costs of indoor air pollution concluded that although specific cost estimates were highly uncertain due to data limitations, it was reasonable to estimate that the costs of indoor air pollution including second-hand smoke, in terms of direct medical costs and lost productivity, were probably in the tens of billions of dollars per year. The Agency has begun a multi-year effort to look at the cost implications of a number of indoor air quality control strategies, and information from this effort will help to assess the appropriateness of various control technologies.

While these complexities make the indoor air issue difficult to define, we know enough about the problem to conclude that the risks, both acute and chronic, are significant, and warrant a coordinated and intensive Federal response.

EPA's Indoor Air Strategy

EPA is committed to a pollution prevention approach to indoor air quality. The key elements of that approach are to: seek to minimize peoples' exposure to all indoor air contaminants to the extent reasonable; transfer existing information to those in a position to improve indoor air quality; and conduct research to develop sound scientific information to fill knowledge gaps.

EPA has been given broad authorities under the Toxic Substances Control Act (TSCA) and the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) to address chemical exposure risks. In addition, the Safe Drinking Water Act controls contaminants in drinking water that may volatilize into air from household uses.

For example, radon in drinking water generally contributes about five percent to a home's overall indoor radon levels. Radon in drinking water is estimated to cause over one hundred cancer related deaths each year. Several program initiatives are underway to sharpen the focus of our chemical screening and risk management programs under these statutes to ensure that chemicals that pose unreasonable risks indoors are identified and addressed. These initiatives include a clustering approach to screening indoor pollutants and indoor pollutant sources more expeditiously, and a graduated response to risk reduction which seeks to increase the flexibility with which our TSCA authority can be used. The Agency supports aggressive utilization of its combined statutory authorities to identify specific pollutants that present direct health risks in the indoor environment and to use a variety of means to reduce their level indoors.

Simultaneously, we are vigorously pursuing an indoor air research program. The results of EPA's indoor air research will improve our scientific understanding of the key factors that determine indoor air pollution health risks and the effectiveness of risk reduction strategies; provide critical scientific information to EPA program offices and regions; and promote private sector involvement in indoor air research.

We have also set a high priority on improving the way in which buildings are designed and operated. We believe this integrated buildings systems approach is appropriate, because there are both a variety of building factors, pollutants, and sources in the indoor exposure equation, and because there are very real limitations to our understanding of the health effects of exposures to pollutant mixtures. The buildings systems approach seeks to achieve real and significant reductions in exposure to all biological and chemical contaminants indoors, quickly, by employing prevention techniques aimed at reducing risks across the board.

Our approach revolves around two simple policy principles: first, that it is prudent to minimize human exposure to biological and chemical contaminants indoors to the extent practicable; second, that reductions in exposure can best be achieved by utilizing an integrated strategy of source management wherever feasible, adequate ventilation at all times to all occupied spaces, and, where appropriate, air cleaning as an adjunct to (but not a replacement for) the first two strategies.

This strategy stresses an integrated approach to indoor air quality, with attention to building design, construction, commissioning, operation, and maintenance as the most practical approach to exposure reduction. Focusing on building performance ensures that all potential indoor pollutant sources receive adequate attention, and that the critical elements of ventilation system performance, building maintenance, and occupant activities are integrated into a cohesive strategy. This minimizes the potential for indoor air quality problems to develop and occupant complaints to escalate, and ensures that practical, cost effective problem identification and problem-solving tools are provided to those in a position to affect the quality of the indoor environment.

Program Accomplishments

Our indoor air strategy is embodied in a comprehensive guidance manual for building personnel that we issued, in cooperation with the National Institute for Occupational Safety and Health, in 1991. Entitled *Building Air Quality: A Guide for Building Owner's and Facility Managers*, this book made the Government Printing Office's "best seller list" shortly after its release. More than 16,000 copies have now been sold. Since its publication, we have supported the training of more than 5,000 building owners and facility management personnel on the use of the Guide. This has been accomplished through the cooperative efforts of the Building Owners and Managers Association, International, and through the Agency's Regional Radon Training Centers.

In the coming year we hope to establish a voluntary partnership program. Such a program would take more aggressive steps to institutionalize the practical guidance in Building Air Quality by providing opportunities to owners, managers, and occupants of public, commercial, and school buildings to enter into voluntary partnerships with EPA to implement these prevention and problem solving approaches in their buildings.

We are also about to publish and promote a public information brochure on the hazards posed by environmental tobacco smoke exposure. In January, the Agency announced the completion of its risk assessment on the respiratory health effects of passive smoking. Now we are ready to take the next step and tell the public and policy makers how to control exposure to this known human carcinogen.

Our source characterization project is comprehensively addressing source management concerns. Those classes of products which are major contributors to indoor air exposures and risks are identified in the Source Ranking Database. By this fall the database will allow us to begin systematically reviewing and comparing source categories to identify high-priority categories for testing, risk management and pollution prevention.

One additional accomplishment I would like to mention concerns the inauguration of our Indoor Air Quality Information Clearinghouse, IAQ INFO. Beginning last October, the public has toll-free telephone access to a central source of information on indoor air quality. Trained individuals respond to questions directly over the phone; send out government publications on a variety of indoor air topics; refer callers to other public and private sector organizations with information on the topic of their concern; and consult a database of over 3,000 literature sources on indoor air when more detailed responses are needed.

RADON

I now would like to turn my attention to EPA's radon action program.

Health Risks and Scope of Problem

Health Risks

Radon is estimated to be the nation's second leading cause of lung cancer, behind smoking. There is consensus among the scientific community, including the World Health Organization, the National Academy of Sciences, the International Commission on Radiological Protection, and the National Council on Radiation Protection and Measurements, regarding the carcinogenicity of radon. Estimates of the health risks from radon exposure are based on extensive occupational human data, including epidemiological studies of thousands of underground miners, and are supported by animal studies. Major national and international health organizations such as the Centers for Disease Control, the American Lung Association, the American Medical Association, and the American Public Health Association agree that indoor radon is a serious public health threat.

It is estimated that between 7,000 and 30,000 lung cancer deaths in the United States each year are attributed to radon. The combination of smoking and exposure to elevated radon levels presents especially high risks of lung cancer. Both adults and children are at risk from elevated levels of radon in homes and schools. EPA's current health risk estimates assume that radon poses the same risk to children that it does to adults.

Although we know a great deal about radon health risks, some uncertainty still exists. Some of this uncertainty was addressed through the National Academy of Sciences' "Comparative Dosimetry of Radon in Mines and Homes" report. This report concluded that epidemiological studies of miners could be used to estimate risk in homes, but that a radiation dose in homes may pose 20–30% less risk than the same dose in mines. EPA also has recently begun a new effort with the National Academy of Sciences (NAS) to update underground miners data and recent studies of residential radon exposures. We expect to complete this study in three to four years. In addition to these activities with NAS, there are many ongoing residential epidemiology studies being conducted around the world. As with other cases of significant research, EPA will work with its Science Advisory Board to review findings from this research and to refine radon health risk estimates.

Scope of Radon Problems

From our surveys we have estimated that six million homes in the United States have elevated levels of radon. And although some areas of the country have a higher potential for elevated radon levels, we have found homes with elevated levels in low potential areas as well; some of the highest recorded levels have actually been measured in low radon areas. Additionally, even if one house tests low, the neighboring home could have elevated levels. These findings are the basis for EPA and the Surgeon General's recommendation that all homes below the third floor of a building be tested for radon, and elevated levels be lowered.

Radon in Homes

Generally, the greatest exposure to radon occurs in homes because that is where people spend most of their time. EPA's national assessment of annual average radon levels in homes found that approximately six million homes have annual average radon levels that exceed EPA's action level of 4 picocuries per liter, and that the national average radon level in homes is about 1.25 picocuries per liter. EPA has also conducted joint radon screening surveys in 42 states and seven Indian Nations, and six other states have conducted their own statistically-valid surveys. Elevated radon screening levels have been found in homes in every state, with some states having more extensive problems than others.

Radon in Schools

EPA has recently completed a national assessment of radon in schools which also found elevated radon levels in schools. Results from this study indicate that approximately 15,000 public schools in the U.S., or nearly one in five schools, have at least one room with an elevated screening level above EPA's action level of 4 picocuries per liter. Schools with radon problems can be found throughout the United States.

Radon in Federal Buildings

Under direction of IRAA, in April 1989 the Agency began to work with other Federal agencies to develop and review radon study designs. As of late 1991, approximately 20,000 Federal buildings had been tested for radon with about 5 percent of these buildings having at least one test result of 4 picocuries or higher.

Strategy of Radon Action Program

The goal of EPA's Radon Action Program is to significantly reduce the public health risks of radon. The 1988 Act directed the Agency to provide information to the public to enable them to make informed decisions about radon, technical assistance to the industry and States, and financial assistance to States. Additionally, in 1990, the Radon Program requested an evaluation from EPA's Office of Policy, Planning and Evaluation (OPPE). OPPE organized a panel of senior EPA managers, who also held a series of meetings with national experts outside the Agency, to review and provide recommendations for the Radon Program. Many of the panel's recommendations further refined the direction that IRAA had given the program. The following are the five recommendations which were made:

1. Focus on the greatest risks first.
2. Promote radon-resistant new construction.
3. Support testing and mitigation in connection with real estate transactions.
4. Develop a new strategy for public information.
5. Develop a coordinated research plan.

The Radon Program is conducting a number of activities that are consistent with the recommendations and directions given by the OPPE panel. These activities are discussed in the following section.

Program Accomplishments

Technical Assistance to Industry and States

Early in the program, we recognized that reducing radon exposure would require the joint efforts of Federal and State governments and the private sector. The objective of our technical assistance is to ensure that the public has access to reliable radon measurement and mitigation services, and that there are knowledgeable and informed State and local officials to assist them in reducing their risk. EPA develops and refines protocols for radon measurement and remediation in residences, schools, and large buildings; sponsors research on new radon measurement, diagnostic, mitigation, and prevention techniques; and transfers technical capabilities to the States and the private sector. Through the House and School Evaluation Programs, EPA has transferred technology in radon diagnostics and mitigation techniques to private sector mitigators and State and local personnel. These programs have provided classroom instruction and field experience for their participants.

Radon Proficiency Programs

As directed by Congress, EPA has established two voluntary proficiency programs that evaluate the capabilities of the radon industry and distributes lists of qualified firms to States and consumers. The Radon Measurement Proficiency (RMP) Program, established in 1985, is designed to ensure homeowners access to reliable radon measurement services, and to provide nationwide consistency of radon measurements by setting minimum performance requirements for the industry and for test devices.

The RMP Program enrolls firms on a continuous basis. To strengthen the quality of measurement services available to consumers, EPA has made the program's requirements more stringent. For example, all applicants must have Quality Assurance Plans which describe the control Is that measurement firms have in place. All RMP-listed individuals also must pass biennial examinations to ensure that they continue to offer the public high-quality measurement services.

In the fall of. 1989, EPA established the voluntary Radon Contractor Proficiency (RCP) Program to evaluate the proficiency of radon mitigation contractors. This program provides coursework and an examination, trains participants in the latest mitigation technologies, and distributes lists of successful participants to all State radon offices to respond to public request for names of qualified radon mitigation contractors.

Radon Regional Training Centers

EPA has established four Regional Radon Training Centers that provide access to radon training throughout the United States. These regional training centers—based in New Jersey, Alabama, Minnesota, and Colorado—transfer the latest information regarding radon measurement, diagnosis, and mitigation to Federal, State and local officials, and to the private sector. Training seminars at the four centers ensure that qualified personnel are available to provide accurate and current information to the public regarding the risks of radon and technologies for measuring and mitigating indoor radon. The training centers also administer the exams for both the Radon Measurement Proficiency and Radon Contractor Proficiency Programs.

Schools

In April 1989, EPA issued a national recommendation that all schools be tested for radon. To support States and school districts in addressing radon problems, EPA issued interim guidance on school testing and mitigation in 1989. Although school testing. and mitigation can successfully use many of the approaches developed for homes, radon concentrations in schools are influenced by special factors such as building construction and heating, ventilation, and air conditioning systems. Through research and field work—such as EPA's School Evaluation

Program—the Agency is continuing to improve measurement and mitigation techniques for school buildings and is revising both documents. We expect to issue final measurement guidance to schools in a few months, with final mitigation guidance following in the near future. The interim school mitigation guidance, in the meantime, is still applicable. Additionally, EPA's Office of Research and Development has completed development of guidance on radon control for schools and large buildings through new construction. This guidance, "Radon Prevention in the Design and Construction of Schools and Other Large Buildings," will be available to the public later this year.

With the publication of the Agency's revised radon measurement and mitigation guidance for schools, EPA will continue to work closely with States and various education groups to promote radon testing and mitigation in our nation's schools.

Financial Assistance to States

In addition to technical assistance to States, IRAA directed the Agency to provide financial assistance to States in order to help States establish radon programs. We are pleased that during the first three years of the State Indoor Radon Grants (SIRG) program 50 States, the District of Columbia, and Guam have used these funds to create radon programs that are well-positioned to provide information and support geared to addressing the scope of the radon problem specific to each State. State and local governments play a key role in persuading the public to act. All States, and many local governments, have an existing network of environmental, health, and radiation protection agencies and departments with considerable experience in responding to local problems. EPA is providing 58 million in SIRG funding this year.

Most States have used grant funds to develop radon strategies, distribute public information materials, run radon hotlines, conduct surveys of homes and schools to identify potential radon problems, and, in some cases, establish certification programs for the radon industry in their jurisdictions and begin to work with local governments in highrisk areas. Several States have developed innovative projects which have included: a demonstration of cost-effective radon reduction techniques in low-income housing; a pilot radon teleconference for school officials that reached twelve hundred schools; and a project to develop radon curriculum for junior high and high school science classes.

Many States are using SIRG funding to target high radon areas. These efforts have had an impact as is clearly demonstrated by a recent Conference of Radiation Control Program Directors (CRCPD) survey which found that testing and mitigation rates in high risk areas are almost double those outside of high radon areas.

States have been a vital partner in the national effort to reduce radon health risks. The State Indoor Radon Grants program has been a critical source of funds which enable States to take meaningful steps in alerting the public to the risk of radon, encouraging action, and ensuring the availability of reliable radon measurement and mitigation services. A 1991 CRCPD survey indicated that nearly two-thirds of the States would not be able to maintain an effective radon program without continued State Indoor Radon Grant funding. Further, recent survey research indicates that the States which have the oldest radon programs have the highest amount of testing; a clear indication that sustained awareness increases testing.

Focus on the Greatest Risks First

In 1987, EPA and States developed and began collecting survey data in each State. The EPA/State Survey was designed to characterize the relative severity of the radon problem between States, and to identify high risk areas within each State. As already mentioned, surveys have been completed in 42 States and 6 Indian Lands, and six States have completed their own independent surveys.

More recently we have been working closely with the U.S. Geological Survey (USGS) and the Association of American State Geologists (AASG) to develop a Radon Potential Map to distinguish areas of the country that have the highest radon potential. Information from this map will enable EPA to help States identify a significant proportion of those homes above the Agency's action level in order that these areas can be considered a priority. EPA and USGS have distributed a draft map for final review and expect to release the final map this summer.

We are also working with USGS, as well as the Department of Energy, to identify high-risk areas that have particularly elevated radon levels. This joint project will further refine EPA's efforts to target geographic areas that are at especially high risk from radon.

Promote Radon-Resistant New Construction

As required by IRAA, EPA has recently proposed model construction standards that will prevent radon from entering residential structures. The Agency has worked with the National Association of Home Builders, the National Institute of Building Sciences, national model code organizations and State agencies in developing these voluntary model standards which were published on April 12, 1993 in the *Federal Register* for a sixty day public review and comment.

Widespread adoption of radon resistant construction standards in high-risk areas is cost-effective, energy efficient and could result in significant radon reduction. Hence, the Agency is promoting the use of radon-resistant features to builders and is encouraging States and local governments to adopt these model standards in their building codes.

EPA is also working with its coalition of national organizations in promoting radon-resistant new construction. The National Association of Counties, for example, is working to educate county commissioners, county health officials and local building code officials about how radon-resistant features can be incorporated into local building codes. This outreach effort is focusing on 25 specific counties in high risk areas.

The Agency is continuing to work with the National Association of Home Builders (NAHB) in our endeavor to promote the use of radon-resistant construction. NAHB is conducting research to evaluate the effectiveness of passive radon reduction systems and is helping EPA assess training and information materials builders would need to voluntarily incorporate radon resistant features into their building practices.

Two States, New Jersey and Washington, have already adopted similar radon building codes in high risk areas to ensure that new homes are resistant to radon entry.

Support Testing and Mitigation in Real Estate Transactions

EPA believes that all consumers should be well informed about potential environmental health hazards in homes they may rent or buy. To this end, EPA has recently published its "Homebuyer's and Seller's Guide to Radon" which was reviewed by other Federal agencies, States, the radon industry, scientists, consumer protection organizations, and risk communication experts. EPA encourages the public to test and, where necessary, mitigate homes *before* entering real estate transactions, rather than waiting until a home is offered for sale. However, if people are addressing radon during a real estate transaction, EPA has issued helpful guidance in the "Homebuyer's and Seller's Guide to Radon." This booklet provides information about radon, its health risks, and testing guidance specifically designed for real estate transactions. The Agency is also working with the Employment Relocation Council, the Environmental Law Institute, and real estate organizations to promote radon awareness and testing during real estate transactions.

Several States are already addressing radon during real estate transactions. For example, California, Florida, New Hampshire, New Jersey, and Rhode Island have enacted laws that either require disclosure of radon test results or require that radon information be provided at the time of a real estate contract.

Nearly four million homes are sold each year in the United States. If potential buyers and sellers test these homes for radon and mitigate elevated levels, substantial public health risks could be prevented.

Develop a New Strategy for Public Information

EPA's Radon Action Program continues to provide public information designed to encourage individual action to test for radon and reduce elevated levels. Public awareness is critical for establishing support for institutional adoption of radon policies.

One successful avenue to reaching the public has been through our coalition of national non-profit organizations which include the American Lung Association, the Consumer Federation of America, the American Public Health Association, and the American Medical Association. Local chapters and affiliates of these organizations have held workshops, organized media campaigns, and hosted substantial outreach activities at the State and local levels to encourage public action on radon.

The Agency's policy document, "A Citizen's Guide to Radon," was prepared in 1986 with the assistance of the Centers for Disease Control. As directed by the 1988 Indoor Radon Abatement Act, we revised the "Citizen's Guide" in 1992 to refine our testing recommendations, to provide clear guidance to the public, and to incorporate the best available science. The Agency has also published the "Consumer's Guide to Radon Reduction" to provide readers with information on radon reduction techniques and services.

As part of its new strategy, EPA has begun to target specific groups in its outreach efforts. Aside from issuing a radon public health advisory in 1988, the Office of the Surgeon General and EPA jointly released a public service announcement in 1992 that encourages the public to test their homes for radon and highlights the dangers of combining smoking and radon. The Agency, additionally, has initiated various projects-that serve populations that are not addressed by mainstream programs. For instance, we are working with the National Coalition of Hispanic Health and Human Services Organization to develop a language and cultural adaptation of the "Citizen's Guide to Radon." The National Medical Association, a professional organization that represents 16,000 African-American physicians in the U.S., is also working with the Agency. The organization is actively educating its members about radon health risks in addition to implementing a pilot project to organize African-American civic leaders to promote radon testing and mitigation.

Develop a Coordinated Research Plan

EPA and other Federal agencies have conducted extensive research and collected large amounts of data on radon-related issues. EPA's radon mitigation research efforts have developed the technologies to achieve significant reduction of radon in residences and schools which have been published in guidance manuals widely used by the mitigation industry, home builders, and schools. However, there are still many areas that require further research. The Agency has initiated work with the Department of Energy and the Science Advisory Board to develop an overall coordinated research plan.

Environmental Results

EPA's Radon Action Program has made significant progress in educating the American public about radon. Five years ago, there was virtually no public awareness of radon. Recent research conducted by the Conference of Radiation Control Program Directors shows that today, nearly 70 percent of the public is aware of radon, and in high radon areas, that awareness increases to nearly 80 percent.

Surveys and research now indicate that elevated radon levels can be lowered to 4 picocuries per liter or below, virtually all of the time, and to about 2 picocuries per liter or less in approximately 70–80 percent of all homes; at a cost of between 500 and 2,500 dollars. Similarly, we are encouraged that virtually all new homes built with radon-resistant techniques achieve radon levels below 4 picocuries per liter. Despite this available technology, however, we are concerned that only about 9 percent of our nation's homes have been tested for radon, and only 300,000 homes have been mitigated of the 6 million estimated to have elevated levels. While approximately 22 percent of the nation's schools have done some radon testing, we are concerned that, in many cases, the mitigation of elevated levels in schools is not taking place.

EPA's Position on the Indoor Air Quality Act

Areas of Consistency

Much of the content of S. 656 is consistent with indoor air quality approaches that are already underway either at EPA or within other Federal agencies whose responsibilities would be affected by this bill. For these reasons, the Agency generally supports this legislation and believes it would positively augment EPA's current efforts to improve indoor air quality.

S. 656 places a strong emphasis on the need for further research, an objective that EPA clearly accords importance. In fact, the Agency's indoor air research budget has increased significantly in the past two years, rising from a virtually constant level of about $2.5 million from 1984 to 1991, to over $9 million in FY 1993. EPA's indoor air research program is divided into five interdisciplinary components to address the following important questions: what are the pollutant emissions from indoor sources, and how do they contribute to human exposures; how many people are exposed to what levels of pollution; what is the quantitative relationship between exposure/dose and adverse health effects in people; what are the likelihood and magnitude of health risks associated with indoor air pollution; and, what are the most cost-effective strategies to prevent or control indoor pollution. Answering these scientific questions requires a strong commitment to research within both the public and private sectors. In collaboration with relevant Agency program and policy offices, the Office of Research and Development has established indoor air research priorities which are cognizant of both EPA's research expertise and related research efforts in EPA, other Federal and State agencies, and the private sector.

The bill's emphasis on information development and dissemination is clearly consistent with the direction we have taken at EPA. Indeed, the major thrust of our indoor air program has been to take what we currently know about indoor air problems and their solutions, and work with experts and outside audiences such as architects and design professionals, health care providers, homebuilders, consumers, public and commercial building managers, school facility operators, building engineers, air duct cleaners, product manufacturers, and others, to produce guidance documents and training materials that address their particular needs for state-of-the-art information. We endorse the underlying premise of S. 656 that further research and nonregulatory approaches to indoor air quality are the most effective. We believe that significant benefits can be realized by informing key audiences about the prevention and problem solving actions they can undertake voluntarily to improve indoor air quality.

We also recognize the importance of coordination, another over-arching feature of S. 656. Indeed, coordination—between Federal agencies, between EPA's own Headquarters and its Regional Offices, and between the Agency and our outside constituencies, be they consumer groups, health advocates, States and localities, or professional and trade associations—is the key to effective communication.

Areas Not Addressed

While in many ways, S. 656 reflects the course of action EPA has already set, there are important elements of EPA's current program which are not included in this bill. The first of these is the Building Assessment and Survey Evaluation program, or BASE, a national study of indoor air quality in public and commercial buildings. BASE is being undertaken to develop baseline information on the factors believed to affect indoor air quality in large buildings, and to begin to assess their relationship to occupant health symptoms. The data will be collected by a number of investigators, both public and private sector, using a uniform protocol for their measurements and a standardized questionnaire to determine occupant perceptions. These data will be compiled in a publicly accessible data base, so they can provide support to researchers exploring the relationships between certain indoor conditions and occupant perception, and serve as the basis for designing future building studies. In addition, these data will help us formulate hypotheses about what distinguishes "normal" buildings from "problem" buildings.

Another critical activity now in the development phase at EPA is the voluntary partnership program mentioned earlier in this testimony. Through memoranda of agreement, partners will agree to implement a series of energy-wise, pollution prevention activities designed to produce better indoor air quality for building occupants. These activities are practical, low-cost measures already described in our successful "Building Air Quality Guide," and include such things as adopting effective smoking policies, establishing and adhering to operation and maintenance schedules for buildings heating and cooling systems, and establishing procedures for addressing occupant indoor air quality concerns. We believe there will be strong support for such a program and see significant benefits from making this kind of opportunity available now to building owners, managers, and tenants who are motivated to make improvements voluntarily.

S. 656 would benefit from the inclusion of such initiatives.

Areas of Concern

I would like to turn now to six areas of concern regarding S. 656. These areas include the provisions of the bill addressing: list of contaminants, health advisories, national response plan, Office of Indoor Air Quality, Council on Indoor Air Quality, and research.

List of Contaminants

Section 7 of the bill requires both the creation of a list of indoor air contaminants and the issuance of health advisories. The issuance of a Health Advisory also triggers the concurrent issuance of a Technology and Management Practices Bulletin (Section 6). Because only 240 days are allotted for publishing the list of contaminants, the consultation and public review process, and the findings of adverse impact on human health required before a contaminant can be listed, it is unlikely that EPA would include on the list more than the 10 well recognized contaminants already specified in Section 3 of the bill. That is, the listing is unlikely to identify for the public indoor air contaminants beyond those already recognized as criteria pollutants or hazardous air pollutants under other statutory authorities. Because of the bill's short timelines, EPA will initially be forced to rely on the limited existing data on indoor air exposure and what is currently known about the potential for adverse health effects at low levels.

Health Advisories

Similarly, because of the short timelines, the first round of health advisories on the listed contaminants (6 advisories within the first 18 months; 6 more within the first 3 years), will be unlikely to communicate any new information to the public. Instead, EPA will have no alternative but to repackage existing information on the pollutants about which we know the most and which is already available in a variety of publications.

National Response Plan

Turning to the National Response Plan provision, I would note that the Interagency Committee on Indoor Air Quality (CIAQ) has been in existence since 1983. EPA has devoted considerable staff time and energy to its operation over the past decade. Increasingly, the CIAQ has provided a forum for the development of a coherent Federal response to indoor air quality issues. The co-chairs—EPA, the Consumer Product Safety commission, the Department of Energy, the Department of Health and Humane Services, represented by NIOSH, and the Department of Labor, represented by OSHA—as well as the 16 other member Federal agencies, have significant indoor air-related activities and authorities, which we meet quarterly to discuss.

We agree that a requirement to develop a National Response Plan may sharpen the Federal government's focus on indoor air quality issues. However, we should avoid any implication that this provision will require the Agency to dictate to other departments and agencies how their resources should be spent or how their statutory mandates should be implemented. Each of the Agencies in the indoor arena has its own statutory requirements, although there may be situations in which responsibilities overlap. Any National Response Plan which is required should not attempt to eliminate or stifle independent agency initiatives.

Office of Indoor Air Quality

Of concern is the directive in Section 11 to elevate the Indoor Air Division to office status. In our view, the current placement of the indoor air program is appropriate and effective, for two reasons. First, last October we implemented a reorganization which placed the radon program and the indoor air program under one office director. This change has already begun to leverage Agency resources by integrating some of the key outreach and assessment activities of both divisions. Another reorganization would be disruptive and potentially counterproductive. Second, even were the division to expand to administer new legislative responsibilities, its size would still be commensurate with other divisions within EPA, not offices.

Research

Overall, we would agree that the areas of research described in Section 5 of S. 656 are important. However, Agency flexibility to establish policy relevant priorities for the research program is very important, we believe, to the ultimate success of the program.

We recommend that research into innovative control technologies, and evaluation of technologies developed by the private sector, should be significantly expanded. However, the technology demonstration program should not be limited to public agencies, nonprofit institutions and organizations, employee advocate organizations, and local educational institutions, but also should include the private sector, where many innovative technologies are being developed.

We believe that with some modifications, as outlined above, S. 656 would help move our understanding of indoor air pollution forward. The Administration is therefore supportive of the legislation. We, and other Federal agencies who have concerns about sections of the bill impacting their programs, are prepared to work with Congress to improve S. 656 in these areas.

EPA's Position on the Indoor Radon Abatement Act of 1993

Finally, I would like to discuss EPA's position on the radon bill S. 657. Most provisions in this proposed legislation would enhance the current efforts of EPA's Radon Action Program and, therefore, the Agency is generally supportive of the bill.

Areas of Consistency

For instance, making the radon proficiency programs mandatory would increase consumer protection and improve the accuracy of measurement standards and mitigation services across the country. The continuation of the State Indoor Radon Grants program would help States sustain awareness and further reduce the public's risk of radon. And, universal information disclosure and the option to include a radon testing contingency in real estate contracts could help greatly to spur testing as part of real estate transfers.

Area of Concern

The Agency has reservations about one section of the bill concerning Federal Buildings. The proposed legislation would require the Administrator, in consultation with the heads of affected Federal agencies, to develop and submit to Congress a radon assessment and mitigation plan for all Federal buildings. We believe that each agency should have the responsibility of fulfilling these proposed requirements. We are confident that EPA can provide adequate technical assistance and guidance in the mitigation of elevated radon levels. As was true of S. 656, we, and other Federal agencies who have concerns about sections of the bill impacting their programs, are prepared to work with Congress to improve this legislation.

In general, we support the radon bill before this committee because of its capacity for enhancing our nation's efforts to reduce radon health risks to the public.

Conclusion

Resource Concerns

Although I can say without hesitation that the Administrator and I support the goals and purposes articulated in these two bills, we are concerned that compliance will require staffing and funding commitments beyond what is currently appropriated.

The Agency estimates that both S. 656 and S. 657 will require additional resources for implementation of the new indoor air and radon activities. EPA would reprogram to the maximum extent possible in order to meet the requirements of S. 656 and S. 657 in FY 1994. Funding for these new activities will be considered as we prepare for the FY 1995 Budget. It is likely that constraints on discretionary spending will increase in FY 1995, and funding for these programs will have to compete with other important priorities.

General

I am impressed by EPA's radon and indoor air quality programs in developing comprehensive and informative approaches to indoor environmental quality. EPA is committed to a pollution prevention approach to indoor air quality. The key elements of our approach have been to seek to minimize peoples' exposure to all indoor air contaminants to a reasonable extent; transfer existing information to those constituent communities in the best position to improve indoor air quality; and conduct research to develop sound scientific information. With respect to radon, our goal is to significantly reduce the public exposure to radon with a focus on the greatest risks first and an emphasis on the promotion of radon resistant new construction to prevent radon from entering residential structures. In addition, these approaches have involved, from the outset, broad consultation and collaboration among private and public sector experts.

The Indoor Air Quality Act and the Indoor Radon Abatement Act build successfully upon the approaches and efforts EPA has taken in the establishment and implementation of its current programs. Administrator Browner and I remain steadfast in our desire to work with this committee to ensure that the indoor air quality of cur nation is improved.

This concludes my prepared testimony. I would be happy to address any questions you may have.

ANSWERS TO QUESTIONS FOR THE RECORD

THE HONORABLE ROBERT M. SUSSMAN, DEPUTY ADMINISTRATOR, ENVIRONMENTAL PROTECTION AGENCY

ENVIRONMENTAL TOBACCO SMOKE

As you know, on January 7, 1993, the EPA issued a risk assessment on Environmental Tobacco Smoke (ETS) that concluded that ETS was a Class A carcinogen like asbestos, benzene and arsenic. Does Administrator Browner or any other non-career official at EPA have any misgivings about the substance of this report? If not, do you support its conclusions?

> Neither Administrator Browner nor I have any reservations about the ETS risk assessment. I understand that the assessment was an exhaustive one, and underwent extensive peer review by EPA's Science Advisory Board, which unanimously endorsed its conclusions and methodology. We fully support the risk assessment's conclusions that environmental tobacco smoke poses a significant public health risk to both children and adults.

The report seems to indicate that ETS has a disproportionately harmful effect on the health of children. Do you agree with this assessment?

> The assessment clearly documents significant respiratory health effects in young children, which include increased frequency of respiratory disorders such as pneumonia and bronchitis as well as increased frequency and severity of asthma attacks. While the report documents more serious acute respiratory problems in children than those documented for adults, the fact that ETS has been classified as a known human carcinogen indicates that the potential risks for adults are also of great concern.

What policies would you recommend that would protect children from being exposed to ETS?

> EPA recommends that every organization dealing with children should have and enforce a smoking policy that protects children from exposure to ETS.

What type of policy could ensure protection of non-smokers from exposure to secondhand smoke? Is this policy consistent with the current policy at EPA and HHS?

> Generally, the most effective smoking policies are those that eliminate involuntary exposure of nonsmokers to ETS either by prohibiting smoking indoors completely or by restricting smoking to special smoking rooms that exhaust smoke to the outside and prevent smoke from drifting to other parts of the building. EPA's current policy is consistent with this approach. I am no certain of the exact nature of the HHS policy and they would be in a better position to respond to this question.

RADON

What areas of your program have been reviewed by the EPA Science Advisory Board?

> EPA's Science Advisory Board (SAB) has reviewed and/or provided comments on many of the major scientific issues which form the basis for EPA's Radon Program. These include EPA's radon risk estimates and associated uncertainties, design of the National Residential Radon Survey and National School Radon Survey, the Radon Measurement Proficiency Program, cost-effectiveness analyses, and the Agency's analyses on the relationship of short-term to long-term measurements and the use of short-term measurements in making mitigation decisions. The SAB has also reviewed the presentation of the scientific in-

formation in the Agency's primary public information documents on radon: the *Citizen's Guide to Radon and the Home Buyer's and Seller's Guide to Radon.*

Are there any instances when you haven't followed its advice and why?

EPA's Radon Program strongly relies on the expertise and advise from the SAB to provide guidance on scientific issues. The Radon Program has worked closely with the SAB and consistently followed the advice provided by the Committee.

Has the Science Advisory Board reviewed and approved of the risk estimates you have developed for radon?

Yes. The Radiation Advisory Committee of the SAB has reviewed the Agency's radon risk estimates and associated uncertainties in April, 1991. The SAB responded to the Agency in January, 1992, finding the methods and data used by the Agency to be appropriate.

Why is it important to reduce exposure to even slightly elevated levels of radon?

EPA's radon action level of 4 picoCuries per liter (pCi/L) is technology-based. Risks exist below this level and there is agreement among the major radiation organizations that there is no evidence of a threshold for radon.

While risks appear to increase as total exposure increases, there is currently insufficient data to determine whether or not there is a safe level of exposure. Therefore, it is prudent to reduce exposure to even slightly elevated radon levels.

Additionally, exposures cannot be viewed in isolation since each is a contributor to total cumulative exposure. We may not know an individual's former exposure level and we cannot reliably predict the future levels of home, school and workplace exposure to which former and current exposures will be added. Therefore exposures should be kept "as low as reasonably achievable".

Some scientists have questioned the risk posed by radon because they have not found increased incidence of lung cancer in ecological studies. Do you use such studies in determining the risk posed by radon?

No. EPA does not use ecological studies in determining the risk posed by radon. Ecological studies, are crude incomplete studies which analyze groups rather than individuals. Selection of these groups is usually based on geographic parameters. While such studies are relatively inexpensive and relatively convenient to conduct, they are not recommended for identifying the cause(s) of a disease.

For ecologic studies of radon risk, the average radon exposure and the lung cancer mortality for each group can be identified. However, there is no way to relate the level of radon exposure for an individual to that individual's health status. The number of lung cancer patients with a history of elevated radon exposure or the number of individuals with elevated radon exposure who later developed lung cancer is not determined. Because the unit of analysis is the group, this study design is incapable of assessing individual smoking experience or the effects of family mobility, both very significant factors in radon risk assessment.

Because of the inherent methodological limitations of ecological studies, this type of study design was specifically "not recommended" for the study of residential radon risk by the Study Design Group of the International Workshop on Residential Radon Epidemiology held in Alexandria, Virginia in July, 1992. Stidley and Samet (in press) recently reviewed IS ecological studies published through mid-1992, and provided an overview of ecologic methods used to investigate radon and lung cancer.

Their paper also discourages further ecological studies of indoor radon and lung cancer.

I understand that there are residential epidemiological studies being conducted on the risk posed by radon. Will these studies conclusively establish the risks?

There is unfortunately no guarantee that the on-going residential epidemiological studies will conclusively establish the health risks of residential radon. Unfortunately, almost all the ongoing studies lack sufficient numbers of study cases to define the dose-risk radon lung cancer relationship. Only the German study has a case population approaching the required numbers.

To bypass this problem, there is an international effort underway, sponsored by the US Department of Energy and the Commission of European Communities, to pool the data from these on-going studies. However, this effort has its own difficulties. Since they were not designed to be pooled, not all the studies are compatible. They used different measurement devices, different measurement times, different case definitions, different exclusion criteria, different smoker/

non-smoker mix of subjects, different definitions of smoking, and different questionnaires. There is a question about the validity of pooling the results of such diverse studies. The great differences in heredity, diet, and customs, make it questionable to extrapolate results from other countries, particularly those with less industrial development, to the US population.

Do your risk estimates assume that children have increased susceptibility to radon?

No. Scientists have long been concerned that children's higher metabolic and breathing rates coupled with the greater sensitivity of rapidly multiplying cells and organs place them at greater risk from exposure to cancer causing agents. Studies of atom bomb survivors indicate a greater cancer risk for childhood radiation exposure. Additionally, children would have a longer post-exposure lifespan during which the latent effects could express themselves. A recent Chinese miner study showed that the pattern of excess risk by age at first exposure is not consistent. Therefore, there is currently no conclusive data on risk of childhood exposure to radon. Our current risk estimates project risks for childhood exposures which are similar to equivalent cumulative exposures acquired as an adult.

Are radon levels in schools uniformly higher when the schools are unoccupied?

No. A 1991 study in a limited number of schoolrooms found that there was no consistent pattern of fluctuations in radon levels in the sample classrooms. This same study found that radon levels are on average only about 10–20% higher during unoccupied hours than during occupied hours. In some cases, the radon levels were higher during occupied hours, in others they were lower. In some cases, radon levels dropped quickly during the day, in others they dropped slowly.

Why have you established a 4 picocurie per liter action level for radon in schools?

Because we assume there is no safe level, radon action levels are technology-based. Schools, like homes, can consistently be reduced to 4 pCi/L or below with current technology.

Although children may only spend approximately 10% of their time in schools, these exposures cannot be viewed in isolation since each radon exposure, regardless of where it is acquired, is a contributor to cumulative exposure. It can be assumed that areas prone to elevated radon levels in schools are also more likely to exhibit elevated residential levels. Therefore, elevated school radon exposures are most likely added to high residential exposures and should be kept "as low as reasonably achievable."

How many of the nation's schools have tested for radon?

EPA has tested approximately 1,000 schools and estimates that approximately 20% of the nation's schools have been tested for radon. Although this figure is based on several reliable sources, it is difficult to get an exact estimate because most schools are not required to report their tests.

How many of the nation's schools are in radon priority areas?

EPA's National School Radon Survey estimated that approximately 16% of the nation's schools are in Zone 1 (high priority) areas. Approximately 6.8% of the schoolrooms in Zone 1 are estimated to have elevated radon levels (equal to or greater than 4 pCi/L), compared to the national estimate of 2.7%. Approximately 30,000 of the 70,000 elevated schoolrooms are located in Zone 1 areas.

How many states have used state grant funds to test for radon in schools?

41 states have conducted some type of measurement study or testing and 37 states are conducting outreach and training to schools using state grant funds. Only 8 states report conducting or assisting school mitigation projects in 85 schools. Only 19 states report some kind of mitigation activity.

Does EPA have any cost-effectiveness figures to accompany your guidance for testing and fixing radon in schools?

Although we haven't completed a rigorous analysis yet, preliminary information suggests that the cost-effectiveness of addressing radon in schools will likely be in the same range as efforts in homes. This is because while children, teachers, and other school personnel spend less time in schools than in homes, mitigation of a schoolroom is similar in cost to home mitigation, but will reduce the radon risk to a larger number of individuals (i.e., 10–30 people).

Testimony from the New Jersey
Department of Environmental
Protection and Energy on
U.S.S. 657;
Presented by Dr. Jill Lipoti, NJDEPE;
Before the Senate Subcommittee
on Clean Air and Nuclear Regulation
on behalf of New Jersey and the Conference
of Radiation Control Program Directors

May 25, 1993

Good morning Chairman Lieberman and Members of the Subcommittee on Clean Air and Nuclear Regulation. Thank you for the opportunity to comment on the pending Senate legislation S-657, the "Indoor Radon Abatement Reauthorization Act of 1993". I would like to begin my testimony by thanking the sponsor of this bill, Senator Lautenberg, for his continued support on radon. Radon, an environmental issue with no human villain, has found a human hero. Through Senator Lautenberg's efforts the original Indoor Radon Abatement Act (IRAA) was enacted and in succeeding sessions of Congress he has introduced bills to further inform and educate the american public about the need to test for the presence of radon. The New Jersey Department of Environmental Protection and Energy (NJDEPE) and the Conference of Radiation Control Program Directors support the basic tenets of this bill, particularly continued support to states to aid the development of self-sufficient radon in air programs, and new avenues through which to inform and educate the public on radon through the Medical Community Outreach and Disclosure of Information Concerning Radon Upon Transfer of Residential Property sections. In particular, I will comment on the extension of the Grants Assistance to States program, the Mandatory Radon Proficiency Program, Radon in Schools, and Radon in Water.

First, let me emphasize that we remain concerned over the seriousness of the radon risk in New Jersey. New Jersey excess population risk for radon-induced lung cancer mortality has been estimated for counties and the state using results of radon testing in 5,700 homes in New Jersey and risk factors from the National Academy of Sciences Committee report on the Biological Effects of Ionizing Radiation (BEIR IV). Findings indicate a statewide average excess lifetime population lung cancer risk of 5 x 10^{-3}. The estimated annual number of radon-induced lung cancer deaths in New Jersey is 500. We estimate that such a risk is higher than that for any other environmental source in New Jersey (see Figure 1).

Concerning the legislation before this subcommittee, the NJDEPE supports the continuation of the Grants Assistance to State program. The program is allowing many states to start a radon program and others to address special issues. Three years of funding to New Jersey has allowed our program to work on a number of useful projects including examining the causes for mitigation efforts, as practiced by professional mitigators and do-it-yourself homeowners, failing to reduce indoor radon to acceptable levels; developing school activities, for all three grade levels, to teach about radon; addressing radon in the urban environment; training state and local construction officials on the components of the New Jersey Radon Hazard Subcode (for new construction); developing a more streamlined protocol for identifying and studying elevated radon (greater than 200 picoCuries per liter (pCi/l)) target areas, expanding the participation of the local health officers by training them to conduct the geologic field studies of the area and instructing them in conducting public meetings on the findings; and investigating, via survey, the role of radon in real estate transactions. However, the amendment in the bill regarding the Grants Assistance program maintains the state match at 50%. Given the fact that a majority of state radon programs, although this does not include New Jersey, are comprised of one or less full time professionals, we recommend that the federal share be at least 75% in each of the continuing years of the program.

The subject of a federal Mandatory Radon Proficiency Program is one which we do not think should be addressed in this bill and which we believe should be left to states. As you are aware, direction for development and implementation of a voluntary radon proficiency program appears in Sec 305., Technical Assistance to States for Radon Programs, of the 1988 Indoor Radon Abatement Act. The assistance efforts of the United States Environmental Protection Agency (EPA), via the voluntary program, started with a radon measurement device proficiency testing program and a training and exam program for radon mitigation contractors. However, the voluntary proficiency programs have continued to grow in scope over the last few years and now contain components which greatly exceed the original assistance levels to states and which, as a whole, duplicate and in some cases interfere with components of established state certification programs. For example, the EPA's current Radon Measurement Proficiency (RMP) Program has added the following components: measurement contractor exam, quality assurance plan and protocol and reporting requirements. Currently, you must participate in and pass all components to have "successfully completed" the RMP program and to be considered EPA listed. Barring any details yet to come from EPA on what would constitute successful completion under a mandatory program, we will assume, for sake of discussion here, that these same requirements above would hold for the mandatory program. In addition, we are assuming as a practical matter, not with standing the language in Section 319 (a), over time components of a federal program would supplant major portions of a state program.

How would a federal mandatory measurement proficiency program impact the New Jersey radon professional certification program? In New Jersey, we require businesses to demonstrate device proficiency once a year. The RMP's move to a year round testing program was a good idea, when compared to the previous process, but due to the number of businesses participating in the RMP, there is no way New Jersey certified firms can meet our once a year proficiency test requirement by participating in only the RMP. Therefore, we have established an alternate RMP with the Radon Reduction and Testing chamber in Norcross, GA and the Radon QC chamber in Northbrook, IL to provide proficiency testing for New Jersey certified firms when the RMP cannot provide services within the timeframe required in our regulations. It is not clear how a federal program would affect this requirement.

In New Jersey, we have two categories of measurement contractors: measurement technicians and measurement specialists. A measurement technician is a person primarily responsible for performing radon and radon progeny measurements. A measurement specialist may also perform radon and radon progeny measurements but is also responsible for review, approval and verification of test results and implementing, maintaining and ensuring quality control procedures. Every certified business must have at least one specialist, but may have any number of technicians. In order to be classified as either, training, experience, examination and continuing education requirements must be met. There is currently only one level of RMP exam and that exam is designed for a person at a level between our specialist and technician. Therefore, a federal program might require us to drop the specialist category, a category which we believe has served us well. Additionally, a federal exam would not question individuals on State regulations. [As a point of clarification, we developed our own exams in New Jersey not only because we have two levels of radon measurement professionals but because there was no measurement contractors exam at the time our regulations went into affect thereby making it necessary for us to develop our own. We would like to move out of the exam business, but as previously discussed there is much work to be done with EPA on the RMP exam to accommodate New Jersey, and we believe other states requirements.]

The Quality Assurance Plan, and Protocol and Reporting sections of the RMP really begin to address areas where States can provide more specific direction and enforceability through regulation that is appropriate for their citizens and degree of radon prevalence. For example, in New Jersey, we are not following certain elements of the residential testing guidance found in EPA's "A Citizen's Guide to Radon" (Citizen's Guide). The Citizen's Guide advises that the test kit be placed in the "lowest lived-in" level of the home. In our residential testing guidance brochure we advise that the test kit be placed in the "lowest level" of the home. We believe that our approach provides more reproducible results and a better measure of potential radon risk. In addition, the latest version of EPA's "Indoor Radon and Radon Decay Product Measurement Device Protocols" requires that continuous monitors to be run at least 48 hours as compared to 24 hours previously. At this time we have not adopted this requirement because, to the best of our knowledge, there is no quantitative information on which to base a 48 hour test period over a lesser time period of 24 hours and increasing the required test period could be an economic disincentive to the use of such continuous monitors. We believe, due to the manner in which continuous monitors collect data, that these monitors are perhaps the most useful in detecting tampering with radon tests. Under the consistency provisions of Seciton 314, it appears that a federal program would limit our flexibility to pursue these issues.

Beginning this year individuals participating in EPA's mitigation and measurement contractors program will have to demonstrate continued proficiency by re-taking the exam every two years. This is in addition to taking a suggested refresher course before the exam. This updating approach is contrary to that taken by our established state certification program. In New Jersey we require that all levels of certified professionals complete continuing education courses yearly in order to remain up-to-date. At this time, we do not believe that the radon field is evolving so quickly that individuals cannot remain proficient by this method. Thus, we have no plans to move toward a biennial exam requirement.

Last, there is the critical topic of funding. Based on the assumptions we previously outlined, a mandatory federal proficiency program with it's associated fees would draw essential funding away from state programs. This seems contrary to the edict originally written in the State Indoor Radon Grant program, namely that states become self sufficient.

Thus we arrive at a very basic question, what roles should the states and the federal government have in a regulatory radon services program? We believe that because of localized factors, such as radon prevalence and prioritization of issues that individual states need to address, states should decide whether and in what manner professionals should be certified. The federal government should render assistance to states on items best handled at the national level, e.g. standards for device proficiency testing. We do not believe that a traditional federal regulatory program with delegation to states is warranted regarding radon services. Traditionally, such federal regulatory programs have developed along issues around which some basic level of protection is needed nationally, e.g. the Clean Air Act and the Clean Water Act. In these Acts, some minimum standard for clean air and water is provided for all U.S. citizens while states are allowed to institute even lower standards for greater protection. This minimizes the tendency industries might have to move to states with less stringent standards thus subjecting those state's citizens to higher risk and economically penalizing other states with more stringent standards. None of these factors are present with radon. Rather, states may want regulations specific to their situation, thus greater flexibility is needed.

Does this mean that the approach that EPA's voluntary programs has taken is incorrect? No, rather that they must become more flexible in the degree of assistance which they can offer the states and in particular states with established certification programs. Therefore, we make four recommendations regarding this issue. First, we recommend that a national effort regarding proficiency remain one of assistance to states and that states be allowed to pursue regulatory proficiency programs. Second, we would recommend that the current RMP program be divided into at least four separate phases, radon measurement proficiency testing, measurement contractor testing, device quality assurance and testing protocols. States could voluntarily require participation in 1, 2, 3 or all 4 phases. A company fulfilling any one or combination of phases to comply with a state regulation would be considered to have successfully completed those elements of the state's radon proficiency program. We believe this "menu" approach provides the flexibility to the RMP program needed to assist states with various levels of consumer protection radon programs. Third, in order to eliminate duplication of effort by the states and EPA and reduce financial burdens on the industry, we recommend that EPA be required to accept and recognize as "EPA listed" any firm or individuals which have become certified under a state regulatory program. Here we define state regulatory program as one having state legislative authority, state regulations and a funding source for the regulatory program. Fourth, that EPA be directed to work with the National Institute of Standards Testing (NIST) to develop a primary radon standard and that radon testing device "proficiency" be mainstreamed into the same process as other radiation detection devices. These other devices are required to be calibrated on some regular interval, annually, semi-annually or quarterly, against an NIST traceable standard. This type of process would foster greater accessibility to proficiency testing, private industry involvement in supplying these calibration services and likely reduce travel and other costs to radon professionals.

The amendments to the Radon in Schools section contain several important points. In particular, the condition to limit the mandatory testing to areas identified as priority radon areas within a state; the decision to test all types of schools, public and private; the notification of results process and the decision not to mandate remediation but rather to allow the local educational agencies to decide the issue, are commendable.

We are however concerned about the division of financial assistance for school remediation between monies that states can direct to local educational agencies and monies that the Administrator can direct to local educational agencies via the State Indoor Radon Grant program. Administration of financial assistance programs like this is very time consuming. Given limited state radon personnel resources we believe that a school remediation financial program could most efficiently be administered directly by the United States Environmental Protection Agency (EPA). This could be done by means of a grant program, separate from the SIRG program, similar to EPA's Asbestos Abatement Program which awarded funds, through grants and interest-free loans, to school districts across the country based on the degree of hazard within school districts demonstrating financial need. Also, since these funds are to be granted on a financial need basis, we suggest that the match for the local educational agency be lowered to 25%.

Finally, we would like to discuss radon in water which has been introduced as an eligible activity in Section 307, Grant Assistance to States for Radon Programs. Last year, a section was added to Senate bill S-792, known as the Indoor Radon Abatement Reauthorization Act, which directed the Administrator of EPA to conduct a multi-media risk assessment of radon prior to promulgating any national primary drinking water regulation for radionuclides under the Safe Drinking Water Act. We support the effort of setting a radon in water maximum contaminant level (MCL) based on the relative risk of adverse human health effects from all relevant pathways.

As we have previously commented to the Administrator, the EPA proposed radon MCL of 300 pCi/l will offer a health benefit disproportionate to the cost. This means that the MCL proposed for radon does not provide the most effective risk reduction for radon. This is the first time that the EPA has set a standard for a water contaminant taking inhalation into account. Normally MCL's are based on ingestion health risk. EPA has set the standard for radon in water taking inhalation into account because inhalation is the pathway by which lung cancer, the most common health effect of radon exposure, occurs. However, once the inhalation risk contribution from radon in soil gas is compared to the inhalation risk contribution from radon in drinking water, it is not logical to limit radon to 300 pCi/l in water based on the water inhalation pathway. In most cases, radon in soil gas is the primary source of radon in air and therefore represents the largest radon health risk. This is true even assuming that the risk from ingestion of radon is as high as those stated in the proposal. Because of the existence of a source of radon in indoor air that relegates radon in water to what is usually only a minor source, the development of an effective risk reduction policy for radon requires examination of all input sources.

Radon is present at 0.2 pCi/l to 0.6 pCi/l in outdoor air. This ambient radon level effectively provides a lower limit of radon in indoor air. Radon levels in indoor air are typically greater than those in outdoor air (e.g., in New Jersey, the average radon level in indoor air is 2.5 pCi/l). An MCL, based primarily on the water inhalation pathway, of 300 pCi/l would allow (using the 10,000:1 transfer ratio) 0.03 pCi/l of radon to be added to the radon already present in a structure due to soil gas infiltration. This represents an order of magnitude lower radon in air contribution from water than what already exists in ambient air and two orders of magnitude smaller contribution when compared to the soil gas contribution normally found in New Jersey homes.

The table on the next page provides some facts of comparison on radon in air versus radon in water. Perhaps the most striking point in this table is the comparison of estimated cost currently being expended by the federal government in addressing all radiation issues, including the radon in air problem, versus the anticipated annualized costs incurred by public water systems in complying with the proposed radon in water standard. Approximately 5 times more dollars will be spent to reduce a risk, namely radon in water, that represents only approximately 1% of the total radon health risk.

And we believe the projected annualized expenditures presented in EPA's proposal are unrealistically low. Over 75% of the 3,300 public water supply wells in New Jersey are expected to be in non-compliance. It is estimated that the remediation will cost over $125 millon in capital expenditures alone; annual expenditures are estimated to cost $20 million. If we assume that New Jersey contains 3% of the total United States population, and assuming the annual cancer cases avoided, 80, are proportional to this percentage, New Jersey will realize 2.5 annual cancer cases avoided a year. This can be contrasted to the projected 500 lung cancer cases per year in the State attributable to the air pathway. And nationally EPA projects compliance costs to be $1.6 billion in capital and $20 million in annual operating and maintenance costs, while others have estimated the total compliance costs to be between $12 and $20 billion[1]. The later estimates would seem to be more in line with New Jersey's estimate of compliance costs. Such expenditures on the water pathway are not commensurate with the degree of overall radon risk reduction achieved.

	RADON IN AIR	RADON IN WATER
Individual Lifetime Risk[a] (for lung cancer)	$2x10^{-2}$	$2x10^{-4}$
Annual Cancer Cases	21,600	195
Cases Avoided at Action Level/Proposed Standard	8,100[b]	80
Annual Expenditures	$38.7M[c]	$184.6M

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[a] At a radon in air action level of 4 pCi/l and a radon in water maximum contaminant level of 300 pCi/l

[b] Based on an action level of 4 pCi/l in the lowest livable level assuming 100% testing and mitigation with mitigation reducing levels to 2 pCi/l; from, "Technical Support Document for the 1990 Citizen's Guide to Radon".

[c] Combined salaries and expenses, research and development, and abatement, control and compliance line items from the, "1992 Budget of the United States Government".

The EPA representatives we have dealt with acknowledge these logical inconsistencies but argue that they are driven to pursue their course by the statutory language and precedents of the Safe Drinking Water Act (SDWA). We believe that the Congress should review this legal issue. If indeed this is the constraint to addressing this question in a cost effective manner, then the Congress should consider amending the SDWA to address this unique situation.

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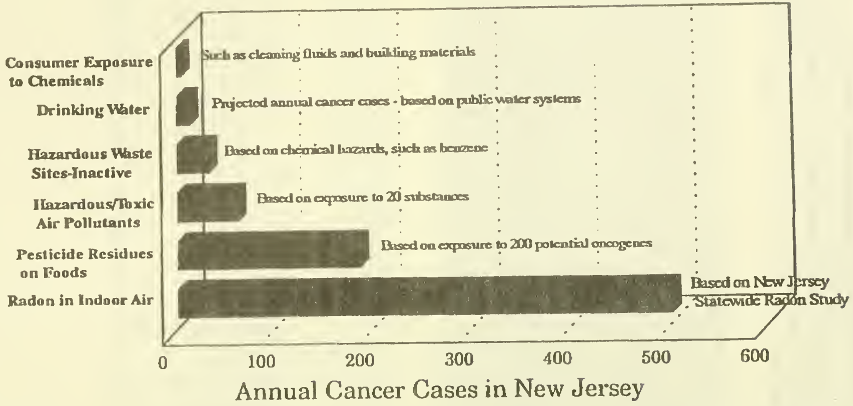
[1] Costs estimates are from, "Radon in Drinking Water: A White Paper", published by the Alliance for Radon Reduction, June, 1992.

Thus we suggest a reconsideration of the inclusion as an eligible activity for states, under Section 307 (c), of providing technical assistance to public water systems and private well owners. We believe that this activity would serve to draw attention and funds from a greater risk, radon in air, to one of lower risk, radon in water. Any assistance to be rendered to public water supplies or private well owners would, in our view, be best handled directly by the appropriate office in EPA.

Once again, thank you for the opportunity to address this subcommittee and comment on the proposed legislation, S-657. If you have any questions, I would be happy to address them.

Ranking of Environmental Problems on the Basis of Population Cancer Risk



Sources: EPA-Unfinished Business: A Comparative Assessment of Environmental Problems, February, 1987, Evaluation of Carcinogenic Risk Assessments as used by the US Federal Agencies in Establishing Standards of Toxic and Hazardous Substances, July, 1985, and the NJDEP-CDM Radon Report, September 1989.

Figure 1

TESTIMONY OF GENEVIEVE MATANOSKI, SCHOOL OF HYGIENE AND PUBLIC HEALTH, THE JOHNS HOPKINS UNIVERSITY, BALTIMORE, MARYLAND

Good morning, Senators. I am Dr. Matanoski, a Professor of Epidemiology at the Johns Hopkins University School of Hygiene and Public Health. I am a physician and epidemiologist. I also chair the Radiation Advisory Committee of the Science Advisory Board of the Environmental Protection Agency. I am not appearing today on behalf of the Science Advisory Board since none of this testimony has had committee review. I am appearing at the request of the Senate Subcommittee. It is my intention today to present background information on the importance of indoor radon exposure to the health of the U.S. public.

Radon is an inert gas which occurs as the natural decay product of radium-226, the fifth daughter of uranium-238. The radon gas can escape into soil, water and air. The gas can escape from the soil and enter the basements of homes through cracks in the walls. Radon decays with a half-life of 3.82 days into radon daughters which further decay into solid, short-lived radioisotopes which last a matter of minutes before forming the next daughter in the chain. As they decay, they give off alpha particles which have high energy and high mass. These particles do not penetrate far below a surface but, when these radon daughters are inhaled into the lungs, they can damage the lining cells of the lung possibly causing cancer. The cancer risk from radon will depend on the number of radon daughters which can get to the susceptible tissue in the lung. Although there are other sources of radon exposure as in the outdoor air and in water, the most important risk in residences is through entry of the gas from the soil into indoor air.

The risk of radon has been known for several years from studies of uranium and other miner populations. The risks in these workers are reported as working level months (WLM). This is an exposure level to a given amount of alpha particles (1.3×10^5 MeV) in 170 working days. The excess relative risk of lung cancer per 100 WLM in these miners ranges from 0.5 to 3.0 per 100 WLM. This means that receiving 100 WLMs of exposure increases the risk of lung cancer in these miners is increased from 50% to 300% over the risk of that of the general population. The data also indicate that smokers in this population may have a risk that is greater than what would be expected if we simply added the risk from radon and the risk from smoking together. The risk for smokers per dose of radon is about 10 times higher than it is for non-smokers (BEIR IV). Few scientists would question the risk of lung cancer from radon identified in miner populations. The only questions relate to whether other exposures in the underground environment and smoking may modify the risk. The questions arise when we attempt to extrapolate these occupational radon risks to those of the general population from residential exposure.

The scientific community has recognized that there are many differences between the risks which might be present in mines versus households. The first is that the females and children are exposed in homes and there are no or little data for these groups in the mine studies. The duration of exposure is longer in residential settings with possibly lifetime exposure risks. Other factors include biological factors associated with work which may alter risks, such as, dust levels which may influence the level of radon daughters which can get to the lung, dose rate and others. In addition, the risk associated with miners is due to high levels of radon exposure and we must estimate or calculate a model curve which will determine how that exposure at the high end equates with household exposures which are 10-fold or more lower than that of the mines. Scientists have different opinions as to how this extrapolation should be done. Despite all of these differences, most scientists will agree that radon causes lung cancer and that there is no reason to think that there is a level of radon to which you can be exposed that cannot result in a risk; that is, there is no evidence that there is a threshold effect from this agent.

The average levels in U.S. homes is 1.25 picocuries per liter (pCi/L) which, even with 70 years of exposure would only equate to about 20 WLM. Thus, most houses have very low or no exposure but the rare house may have levels as high as those found in the mines. It is very difficult to predict the house with high versus low radon levels. There are some areas that appear to have high potential for having high residential levels, so-called "hot spots", but the identification of these areas is not simple. Therefore, the EPA is recommending universal testing of homes. This decision has raised interesting questions. Variations in instruments and the conditions of the test may cause variation in results. Thus, if the instrument is placed in the basement and there is no ventilation, the readings will be higher. But the question that has been raised is whether the basement represents the usual exposure area for the resident. The second problem is that action level which is set may identity houses which are false positives. That is, they are houses which might be identified as having a level of 4 pCi/L but which actually is below that level. No instrument can make a perfect reading of the dose of radon daughters to which the resident is exposed and since the frequency of households at high levels is very small, the true measurement represented by any test is more likely to be lower than the value reported rather than higher. However, anyone who takes action to reduce the level of radiation in their house will reduce their risk of lung cancer since there is no safe exposure level for this agent. The benefit to the individual from mitigation is less the lower the true level.

The need to take some kind of action rapidly is more vital for the houses with the highest levels. The household risks can be seen as risks to the individual which can be reduced by taking remedial action. It represents the type of perspective which a patient might take toward a medical screening test. For example, the lifetime probability risk of lung cancer for unexposed men may be about .07 (7/100 or 1/14) (BEIR IV). At 4 pCi/L which is the recommended action level, the probability of lung cancer would increase slightly to .09 (9/100 or 1/11). EPA has indicated that about 1 in every 3 houses have this or higher exposure levels. For the few households with levels of 25 pCi/L, the lifetime risk for individuals is .21 (21/100) or 1/5. Thus, individuals face very different risks depending on the level of exposure. For the majority of the individuals who are at or above the action level, the risk will be clustered around the low level exposures where the increase in individual risk is small. Only 1 to 3% of households are above 8 pCi/L. However, the large number in these low exposure groups represent the source of the population impact on the overall risk of lung cancer. EPA has estimated that 14,000 lung cancers out of the more than 100,000 which occur annually in the population may be due to radon. This population burden of cases represents individuals who are near the average exposure rather than at the high extremes.

Few studies have attempted to look at residential populations in order to estimate the risks in these groups. When exposures are very low as in residential housing, it is difficult for epidemiologic studies to detect a risk. Those studies which have been done to date have had varying results. For most, the number of subjects were far too small to be able to detect a risk. Therefore, it is likely that we will have to rely on the estimated risks derived from occupationally exposed populations which receive higher doses since the population required to establish the risk using a study of residential exposure would need to be very large.

The American public has not become actively involved in testing their homes for radon. For the person monitoring his own residence, it is important that he understand the problem of test reliability and the need to retest to reduce the problem of false positive tests. It would be appropriate to discuss the individual's risk of lung cancer based on the test results. However, at the present time, the testing is not being done to reduce individual risks but is being done primarily for the transfer of property at which time the concern for health is not the important issue for the participants. In this situation, the setting of a strict standard is the aim of both seller and buyer. This may also reflect the need when testing public buildings or initiating new construction. Usually rigid standards are necessary in such situations.

There has been some discussion of other sources of radon exposure. These exposures except for the special populations with radon in the workplace environment are much less important compared to the indoor air source. The risk from outdoor air may represent about 1/20th the risk from indoor air. The risk from radon in water may represent 1/100th the risk of indoor air. The problem that may arise, however, is that for certain individuals living in certain areas where radon exists in the soil, they may be getting exposures from all sources. This emphases the problems that EPA faces in trying to control exposures to radon. It is a naturally occurring material which cannot be controlled at the "source" as is frequently done with chemicals. The mitigation of the problem requires the cooperation of the individual householders. Yet, for the individual, the excess risk is not large for most whose tested level will be 4 pCi/L or below and for whom mitigation is recommended. However, the large number of the population who have that level represent a large number of excess lung cancer deaths per year from radon. In addition, without widespread testing of individual houses, it will be impossible to identity those few houses which actually have levels as high as those within the mines. Therefore, the

EPA is faced with a difficult challenge, the need to detect and control a naturally occurring carcinogen through the motivation of the public to comply with testing and mitigation when for most individuals the reduction in personal risk from the exposure will be minimal. The Agency needs to continue to pursue various methods of approaching the radon problem.

Thank you for your attention.

TESTIMONY BY ARLENE ZIELKE, VICE PRESIDENT, NATIONAL PTA AND THE NATIONAL EDUCATION ASSOCIATION

Good morning, Mr. Chairman and other members of the Subcommittee. I am Arlene Zielke, Vice-President for Legislative Activity for the National PTA. I am here today representing both the National PTA and the National Education Association. On behalf of our combined membership, thank you for this opportunity to present testimony on S. 657, the "Indoor Radon Abatement Act of 1993".

Introduction

The National PTA, which represents close to seven million parents, teachers, students and other child advocates, was founded on the premise of parental involvement and has a long-standing policy of protecting the ecology and environment necessary for the development of healthy and productive children and youth. The National PTA believes that children should be safe from preventable health hazards of any kind, including in the classrooms where they are to learn for three-quarters of every year, and in their homes.

The National Education Association represents more than two million education employees in public elementary, secondary, and vocational schools and institutions of postsecondary education. NEA's members include teachers, education support personnel, higher education faculty, college students, and retired school employees. NEA has long been active in efforts to ensure that schools provide a safe and healthy environment for their students and staff.

Both the NEA and National PTA have worked extensively with Congress and the Environmental Protection Agency (EPA) to reduce and eliminate environmental hazards in schools. While our involvement extends back many years, unfortunately, new environmental problems seem to surface faster than we have been able to eliminate existing hazards. Both organizations were early supporters of the Indoor Radon Abatement Act, P.L. 100–551 enacted in 1988, and we worked with EPA in 1990 to develop and distribute a brochure on radon in schools, specifically targeted to parents. We also reviewed a more detailed EPA booklet entitled, "Environmental Hazards in Schools", which includes a section on radon, and EPA's "Radon Measurement in Schools" guidance manual. In 1989, we joined with EPA and other education associations to organize a series of regional workshops to inform parents, teachers and other school officials about the hazards of asbestos, radon and lead. This statement will briefly outline the hazards of radon, particularly its harmful effects on children, describe why S. 657 is needed, and present our recommendations about how the legislation can be strengthened.

What Is Radon?

Radon is an odorless, colorless, tasteless radioactive gas that is naturally formed as uranium decays. Radon gas seeps up from soil and enters buildings through cracks, pipe seals or other openings, where it becomes trapped and can accumulate to dangerous levels. Radon gas also clings to dust particles that can be inhaled. Radon can be found in all types of structures, including homes, office buildings and schools, particularly in basements or ground level areas.

Because radon cannot be seen or smelled, levels in buildings are detected using specialized monitors that are analyzed by certified laboratories. The EPA has established an action level of exposure of 4 picocuries per liter (pCi/l) that is considered acceptable, but this is not an actual health-based standard. EPA has stated that the longer the exposure, or the higher the level of radon, the greater the risk, however, EPA has also said there is no known safe level of exposure to radon.

Health Effects of Exposure to Radon

The Surgeon General's office of the U.S. Public Health Service, the Environmental Protection Agency and many other scientific and health experts now recognize that radon is the number one environmental cancer risk facing the nation today. More people die from residential exposure to radon than the combined deaths from asbestos, toxic waste dumps, lead paint, formaldehyde, and pesticides in food. In fact, radon ranks second only to cigarette smoking as a cause of lung cancer fatalities.

Three years ago, at a hearing about radon in schools before the Senator Lautenberg's Superfund Subcommittee, Dr. Vernon Houk, then-Assistant Surgeon General of the United States, was asked to characterize the evidence concerning the health threat posed by exposure to radon. He responded by saying, "The evidence of radon is the strongest of any environmental contaminant because our extrapolations and our estimates are based upon human observations at the level that we're talking about at risk. There is no room for debate on this issue. Anybody who tells you differently is ill informed, deceitful, or both."

It is important to test for radon and to mitigate exposure levels above 4 pCi/L because of the potential health hazards of exposure, even at low levels, over long periods of time. Children are far more susceptible to the hazards of radon than are adults. Children do not have fully developed lungs or the elaborate defense mechanisms of adults, and a child's metabolism is more rapid than an adult's, causing children to breathe more quickly. Further, because they are in the early stages of their development, children are at greater lifetime risk of developing cancer as a result of radon exposure. In fact, the Council of Radiation Control Program Directors has stated that exposure to radon during the first ten years of life represents one-third of the risk of total exposure over seventy years.

Radon is a health hazard throughout the country, but there are pockets of the nation with large deposits of radon-bearing minerals. In addition, factors such as the permeability of soil, the proximity of the uranium to the surface, and the type of construction of buildings can give an area a higher probability of having elevated levels. Unfortunately, however, using this "priority ranking" to determine where high levels of radon are found is not an acceptable approach to addressing this problem. As explained below, EPA's survey of schools conclusively demonstrated that many schools—in areas not designated as high priority radon areas—were found to have dangerously high levels.

Background of Radon Efforts in Schools

Since 1988, EPA has been actively advising that most homes be tested for radon. That was also the year that Congress enacted the Indoor Radon Abatement Act (IRAA), which authorized funding for a grant program to help states develop radon programs. In 1989, EPA conducted a preliminary study in 16 states and found that almost 20 percent of the schoolrooms tested had radon levels above EPA's action guideline. EPA has since directed a follow-up, national survey of radon in schools, conducting tests in over 900 schools across the country. EPA recently released the findings of its school survey, and the results are alarming:

- There are over 70,000 classrooms in over 15,000 public schools with radon levels above the EPA action level.
- Nearly 10 percent of the schools nationwide have three or more rooms with dangerous radon levels; over 5 percent of the schools have six or more rooms with dangerous levels.
- In over 10,000 classrooms across the country, radon exposure levels exceed what is allowed in nuclear power plants!
- The highest reading in this survey was 67 pCi/L, however, EPA has found radon screening levels exceeding 100 pCi/L in other schools in the U.S.

All in all, EPA estimates that almost 20 percent of the nation's public schools have at least one ground-contact room with radon above 4 pCi/L. This is a much higher percentage of schools with dangerous levels of radon compared to EPA's estimate for homes, which is six to seven percent (based on EPA's long-term national residential survey). This fact is not surprising due to the structure and function of schools. School buildings, especially those that have undergone recent renovations to enhance their energy efficiency, frequently have high levels of radon. Airtight buildings are more likely to trap high concentrations of radon. In addition, because school buildings are usually structures with large amounts of contact with the ground, there may be many entry points. School heating and air conditioning systems may produce unbalanced air flows and negative air pressure, exacerbating radon levels.

Another important finding of the EPA's survey in schools is that radon was found in many schools in areas not known to have high radon concentrations. This confirms the need, as EPA has stated, to test all schools. In fact, by only testing schools in areas suspected to have high levels of radon, EPA estimates that 59 percent of schools with elevated radon levels would be missed.

Why This Legislation Is Needed

The legislation pending before this Subcommittee is needed to put into law what EPA has already recommended: that all schools test for radon. When EPA first announced the results of its preliminary assessment of radon levels in schools, EPA Administrator William Reilly stated, "Indoor radon is one of the major environmental health threats facing Americans, and I am now recommending that schools nationwide be tested."

The National PTA and the NEA agree with the EPA. We believe that S. 657, while taking steps in the right direction, must be amended to require testing in all schools. We also believe the federal government has a responsibility to be a full partner with the states to help local school districts with this task. The federal government should set professional standards for all radon contractors, and mandate a training and certification process for these same workers. Without these criteria, there will be inaccurate testing, and a wide-open opportunity for unscrupulous companies to take advantage of schools and consumers who will have to depend upon the expertise of others in testing for radon.

We also believe the federal government has a responsibility to assist schools financially with the cost of addressing this problem, which is national in scope. Finally, we believe enactment of S. 657 is entirely consistent with the National Educational Goals now in place, particularly goal number six, which addresses the issue of schools providing children with a safe environment conducive to learning.

In addition, enactment of this legislation will have other effects that are in the national interest. Currently EPA estimates that between six and seven percent of homes nationwide have radon levels above EPA's action guideline, yet only about nine percent of homes overall have been tested. Efforts to test for and mitigate high levels of radon in schools will spill over to homes, because parents, as they become aware of the hazards of radon, will be motivated to test their homes.

We also have evidence that testing for radon will lead to clean-up of other hazardous indoor air pollution problems in schools. Two recent studies conducted by EPA scientists and air quality experts from the American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE) show that poor ventilation is a likely cause of high levels of radon and other dangerous pollutants found in schools. These studies found that schools known to have high concentrations of radon also have other serious indoor air quality problems, and that the results should serve as a warning to parents, teachers, and school administrators.

In their studies, ASHRAE engineers recommended a number of steps school officials could take to improve the indoor air quality in their buildings, including: ensure that their ventilation systems meet local building codes; remove or control indoor contaminants, including chemicals and pesticides; and test for radon. Schools will not know if they have a radon problem, or any other indoor air quality problem for that matter, unless they test. We know from our experiences with lead in drinking water and asbestos in schools that a voluntary testing program is not sufficient. Some states and school districts will test, and others will not. No school will know if there is a radon problem without testing. In order to ensure a nationwide, uniform system for testing, we must have federal legislation such as S. 657.

Our recommendations regarding S. 657. the Indoor Radon Abatement Act of 1993:

As mentioned earlier in this statement, both the NEA and National PTA have been strong supporters of legislation to combat and eliminate environmental hazards in our nation's schools. In the past two Congresses, we supported radon legislation, which was passed each time in this chamber.

Similarly, we supported Senator Mitchell's past attempts to pass indoor air legislation, and his current bill, S. 656, the Indoor Air Quality Act of 1993. We believe S. 656 and S. 657 are complementary efforts, and we are pleased that S. 656 directs EPA to conduct a national assessment of the seriousness and extent of indoor air contamination in schools and day care facilities. We applaud your efforts, and pledge to work with you and your staff to enact strong legislation this year.

We also would like to thank you for working with our organizations and for responding to our past concerns. We had recommended improvements to the bill in previous Congresses, and we see that some of these recommendations are reflected in S. 657. However, there are still a number of changes we believe would strengthen the bill. We urge you to consider the following recommendations:

- In Sec. 303 (a), "Designation of areas", the bill says the Administrator of EPA shall designate priority radon areas, "as expeditiously as possible, but not later than October 1, 1993". This date is unrealistic and we recommend instead that the bill state that the designation of priority areas be made by EPA, within a timeframe tied to enactment, for example, within 30 days of enactment, or within six months of enactment.

- We believe that all schools must be tested, particularly in light of the results of EPA's study of radon in schools. We urge you to extend the testing requirement in the bill to all schools, using a two-tier ranking to prioritize. S. 657 now gives EPA until October 1,1993 to designate high priority radon areas and one year from the date of enactment to publish testing and remediation guidelines. Schools in the high priority areas have two years after designation of the priority areas (or at the Administrator's discretion, 2 years from publication of the guidelines) to complete testing. We recommend that all other schools be given one year beyond that to test. Thus, after four years after enactment, at the most, all schools will have tested. Given the seriousness of the health risk we believe this is more than a generous allotment of time to complete this task.
- In Section 9, (d)(3)(B), a new paragraph (iii) should be added to state that the LEA be required to make available in each individual school the results of the testing in that particular building along with recommended mitigation or other follow-up procedures.
- The notification section should be clarified. In cases where testing does not show elevated levels, we recommend that a notice about the testing and availability of results in the administrative offices, be provided to parent and teacher organizations at that school. It is in everyone's best interest to know that a school has tested for radon and been found safe. If elevated levels are found, we recommend that there should be ongoing notification to parents, teachers and administrators—at a minimum once annually—until the radon mitigation is complete. Notification provisions are an important accountability measure, and should be strengthened in any way to assure that parents, teachers and other interested parties remain informed about efforts to reduce high levels of radon.
- We would also recommend that EPA require school districts to designate someone to be the radon contact in that district. Currently, school districts have such designees for asbestos as required by the Asbestos Hazard Emergency Response Act (AHERA). These contacts are very useful in helping at the local level to coordinate testing and mitigation activities, in providing parents, teachers and others with information about radon in their schools, and in working with the state radon contacts.
- Section 21 of the bill authorizes grant assistance to local education agencies for radon remediation measures. We understand that states are already authorized to provide money to schools for testing, and in fact have been doing so. However, we would like to have a separate authorization for a school grant program apart from the state grant program. Rather than having the authorization of appropriations state, that "not more than one-third [of the funds appropriated]" be used for schools, we recommend that $20 million be authorized each year for five years for a total of $100 million.

Language should be added directing EPA to award the funds to schools based on financial need and the severity of the radon hazard. We recommend that the first year of the five-year authorization cycle be FY 1994, at the earliest. Further, this money should be awarded in a combination of loans and grants (comparable to the Asbestos School Hazard Abatement Act program).

We believe this amount represents a reasonable share for the federal government to assume in this effort. EPA estimates that the average cost of testing a school ranges between $500 and $1,500. The cost to test all 110,000 schools would exceed $100 million. For mitigation, EPA estimates that the average cost of reducing high levels of radon in a school will range between $3,000 and $30,000, depending on the size of the school and the magnitude of the problem. Given the EPA estimate that over 19 percent of schools tested have one room above the action guideline, that is over 15,000 public schools. Based on these estimates, the overall cost of mitigating radon in schools could be well over $200 million.

We know that some schools have already completed testing and mitigation, and that others will not qualify according to EPA's financial need criteria, however, schools will still face substantial need. We believe that $100 over five years represents a reasonable federal share in addressing this need.

In closing, we wish to mention another approach that might coordinate national efforts to eliminate all environmental hazards in school. Rather than the piecemeal approach to making schools safe for children, where we waited for over ten years to enact legislation addressing the hazards of asbestos, and where we have already been working to rid our schools of lead and radon for a substantial number of years, we should look at a more comprehensive approach to hazards assessment in schools.

We know schools are still struggling with asbestos management; we can be sure that schools have an enormous problem with lead-based paint; we know they have lead in drinking water; and they have indoor air pollution problems, including radon, as well. Schools should be required to test for these and other environmental hazards in their buildings, to be sure, but they could be given more autonomy—within the parameters of EPA guidance—to outline specific plans for mitigating the problems, based on the relative severity of each.

Schools should be required to involve the parents, teachers, other school staff, and community leaders in devising management plans that meet the needs of each individual school. This way, local communities would be made aware of the hazards, the relative risks, and the costs for clean-up. Assuring broad public involvement would give school districts the support they need to secure funds to address these terrible problems. In the end, children will be the primary beneficiaries of your efforts, and will be able to attend schools safe from environmental hazards.

Regardless of our approach, we cannot ignore this problem. We cannot postpone testing or mitigation efforts because of monetary cost, at the expense of the health of our children. It is ironic, that in today's furor over educational reform, the "quick fix" approach to perceived failures in academic achievement is to test, test, test. Then, with regard to environmental hazards, which we know pose tremendous dangers to children, schools are opposed to testing—the only effective way to correct the problem . . .

Thank you for this opportunity to present our views. I am happy to answer any questions you might have about our statement.

TESTIMONY BY DR. THOMAS J. GODAR, M.D., DIRECTOR, ST. FRANCIS HOSPITAL AND MEDICAL CENTER

Mr. Chairman and distinguished members of the Senate Subcommittee on Clean Air and Nuclear Regulation, I am Dr. Thomas Godar, Director of the Pulmonary Disease Section at St. Francis Hospital and Medical Center in Hartford, Connecticut. I am also Professor of Medicine at the University of Connecticut School of Medicine, and Associate Clinical Professor of Medicine at the Yale University School of Medicine, in the active practice of chest medicine. Today, I am appearing on behalf of the American Lung Association (ALA). I am a past president of this organization.

The ALA is the nation's oldest voluntary health organization and is dedicated to the prevention and control of lung disease. This organization, and its medical section, the American Thoracic Society, has long recognized the contribution of indoor and outdoor air pollution to the development and exacerbation of lung disease. The ALA has devoted the past 26 years to the implementation of programs aimed at improving air quality in our homes and in our communities.

I am probably the only person in this room who works daily in pulmonary medicine, and as a pulmonary physician, I specialize in the diagnosis and treatment of lung disease. Through my work I have seen the ongoing effects of indoor air quality on lung health. Each year, my department treats thousands of emphysema, bronchitis and asthma patients, the most susceptible to indoor pollutant exposure.

The health threat of indoor air pollution is becoming more and more prevalent as research continues to uncover the dangers associated with exposure to various airborne contaminants. This growing trend is quite evident when one examines the number of pulmonary cases with which I have dealt this year. The ALA is most pleased the Senate Subcommittee on Clean Air and Nuclear Regulation has chosen to examine indepth the impact of indoor air pollution on public health. We are most grateful for the level of concern you have demonstrated here today and for your ongoing commitment to this very pressing cause.

The ALA is aware that several legislative proposals have been offered in the 103d Congress which aim to reduce the threat to human health posed by exposure to contaminants in indoor air environments. We are especially pleased that a proposal offered by the Senate's distinguished Majority Leader, the Honorable George Mitchell, is on the table today. This bill, the Indoor Air Quality Act (S. 656), will authorize a national program to address our growing indoor environmental and critical public health concerns. Our association supports S. 656 and the premise upon which it was introduced. We strongly believe its consideration by this Subcommittee is a significant step toward the elimination of the vast human health hazards caused by indoor air pollution.

The ALA would also like to express its gratitude to the Subcommittee for its consideration of a second initiative to improve indoor air quality, the Indoor Radon Abatement Reauthorization Act (S. 657). This bill, which is sponsored by the distinguished gentleman of New Jersey, Sen. Frank Lautenberg, aims to reauthorize and strengthen existing radon testing, mitigation, and education programs, many of which were enacted under the original Radon Abatement Act of 1988. The ALA supports this policy, essentially because it, too, is vital to human health and safety. With radon gas being the invisible terror that it is, it is even more critical for us to minimize its threat in our homes, communities, and schools.

Mr. Chairman, the ALA would like to offer our analysis of the two bills under consideration today. We do so in hopes that the measure which is reported out of committee strengthens the nation's indoor air policy and its critical components, like testing, research, public education, and funding of new technologies, which have proven to be useful tools in the air pollution abatement and mitigation process. I would like to take the next few minutes to review the provisions of each bill and address briefly those areas of interest to the ALA.

The Indoor Air Quality Act of 1993 (S. 656)

Traditionally, we have considered air pollution to be a problem limited to the outdoors. Indoor environments were often thought to be free of pollutants, and safe enough to protect us from contaminated environments outside. Since this time, we have learned that indoor environments are perhaps more polluted than outdoor environments. It is this notion that poses substantial risks for the average individual who spends 90 percent of the day indoors.

Think of the impact this has upon the stockbroker on Wall Street exposed to secondhand tobacco smoke each day; or, the housewife in Macomb County, Michigan, who inhales household cleaning fumes upon each cleaning; or, the electrician in Del City, Oklahoma working in a building structure, which contains asbestos; or, the sixth grader enduring enormously high radon levels in Tomlinson Middle School in Fairfield, Connecticut.

As you can see, indoor air pollution is an "everyday problem;" its victims can literally be anyone in this room. For its victims, infection may remain dormant and go unnoticed for many years; for others, respiratory disease and aggravation may be exacerbated upon exposure in a single moment. Most of EPA's solutions to these problems have been left to the individual, and since individual control of indoor air pollution is very limited, there is a need for substantial government intervention in this area. The ALA believes S. 656 is a solid legislative initiative, and if implemented, has the capacity to address many of our nation's air quality needs.

The ALA offers the following comments regarding specific provisions of S. 656. We do so in hopes of spurring intelligent legislative debate on the best approach for attacking the indoor air pollution issue:

Section 5: Indoor Air Quality Research

The specific objective for research conducted under this section should be to compile information necessary to enable the EPA to meet other obligations set out in this bill. Thus, research activity to develop better methods for detecting and quantifying exceptionally hazardous chemicals is desperately needed here. Of equal importance is research into and the application of new epidemiological techniques which address the problem of low and chronic dose exposures.

Also under this section are provisions calling for information to assess the relationships between ambient air and indoor air contaminants. We believe this is an essential component in the indoor air quality research piece. We would like to recommend that this provision be strengthen to reflect a similar measure offered in Representative Kennedy's version of S. 656 (H.R. 1930). In this bill, the EPA Administrator is directed to take human exposure to indoor contaminants into account when developing or revising ambient air quality and national emissions standards. The ALA believes this provision is a more comprehensive approach of effectively impacting public health and ensuring indoor air quality concerns are addressed more equitably.

Lastly, the inclusion of a plan to conduct a national assessment of the indoor air problem in our nation's schools is another feature of special interest to the ALA. We recognize that healthy learning is key to the growth and development of our children. Too often, we have observed children are less attentive, less apt to learn in school, due to increased exposure to indoor air irritants. And as trivial as it may seem, their respiratory infections are the number one cause of school absenteeism, which in turn, is a major cause for poor school performance. Next to smoking, frequent childhood respiratory infections are the most important risk factor in the development of chronic lung disease, later as adults.

S. 656 provides a critically needed response plan for our nation's school. The ALA advises that this measure include an adequate testing, research, public education, information, and a funding mechanism for new technologies to ensure its optimal effectiveness. We also hope this provision will lead to improved ventilation systems and routine testing for indoor air pollutants in our schools, for indoor air quality there can significantly impact early childhood growth and development, and the etiology of adult health later in life.

Section 6: Management Practices and Ventilation Standards

The ALA agrees that many indoor air quality problems can be eliminated when ventilation systems are designed correctly and function properly. We are particularly pleased that S. 656 includes a ventilation plan which will review the adequacy of existing ventilation standards and guidelines for their effectiveness in protecting the public's health and safety from indoor air contamination.

Many of our schools, homes and office buildings do not have ventilation systems that work effectively. Very often, systems in public or heavily used facilities have been modified or adapted to employ more energy saving techniques. However, such modifications or inadequate maintenance of these systems have rendered them ineffective and have unknowingly reduced air exchanges. Reduced air flow, or even shutting down a ventilation system may save money and energy, but this coupled with poor maintenance can actually emerge as a greater health threat by allowing pollutants, such as radon and environmental tobacco smoke, to build up indoors.

Adequate ventilation plays a critical role in keeping air clean. With little or no air exchange, the rate of colds and other viral infections is far more likely to occur. In children, because their lungs are not fully developed and do not have the elaborate defense mechanisms found in adults, are far more susceptible to environmental hazards. While colds and viruses are undesirable to all children, children with asthma—3.7 million, or slightly more than one-third of children in this country under the age of 18—are especially at risk for viral infections, and exposure to airborne allergens that can trigger an asthma episode, or attack.

In adults, poor ventilation is a key factor in the high prevalence of work-related illnesses, like occupational lung disease, which was responsible for approximately 16,300 lung cancer deaths in 1990. The major substances which cause this disease include asbestos (found in shipyards, tiling, electrical insulation, and brake linings), textile dusts (found in cotton, flax, and hemp fibers), silica (found in rock quarries, stone, clay, and glass manufacturing), and coal dust (mainly chronic in coal miners).

The ALA believes that government at all levels must ensure our ventilation systems, particularly in public facilities, meet well accepted standards. We support enactment of federal guidelines—similar to those in S. 656—which will provide a basis for setting the ventilation standard for all new commercial and public buildings, and maintenance standards for existing structures, like those in which we live, work and learn each day. We also endorse a ventilation standard which aims to control indoor air pollution by source.

Section 7: Indoor Air Contaminants Health Advisories

The ALA believes the primary function of any indoor air pollution control program is the generation and distribution of health effects information. Sen. Mitchell's legislation has carefully crafted a mechanism for developing health advisories, bearing this purpose in mind. These advisories will serve a dual purpose by providing information to state and local officials for use in their control activities, and to the public to facilitate their understanding of the indoor air problem and the need for more extensive mitigation.

We endorse the concept of compiling a list of contaminants to ensure that certain indoor air pollutants are reviewed. However, we would like to caution the Subcommittee regarding the inclusion of "nitrogen oxide" in its indoor air pollutant list. "Nitrogen oxide" is a chief by-product of gas, oil, or kerosine when burned at very high temperatures in the presence of oxygen. This gas is relatively benign and is unlikely to pose a health threat, until it rapidly oxidizes to "nitrogen dioxide."

Nitrogen dioxide is a more pungent and toxic agent. It is more worthy of inclusion in the contaminants list. Nitrogen dioxide is a respiratory irritant found most commonly around gas stoves. It may interfere with the body's defense mechanism against respiratory infection. Long-term exposure can cause chronic respiratory illness and bronchitis in adults. In children, who are in homes with gas stoves, it has been known to be responsible for higher rates of respiratory infection and below normal pulmonary function.

The ALA would also like to stress the importance of public participation in the ongoing development of a contaminants list. It is critical that the advisory be prepared with public interest in mind. We believe this will enhance public understanding of the indoor air issues and subsequently aid in its use. To this regard, the advisory must carefully and concisely state where there is no known safe concentration for a particular indoor air pollutant, especially for known or suspected human carcinogens. We would also recommend that advisories state a suggested mitigation mechanism for each of these pollutants in those cases where effective measures are known to exist.

Because of the critical need for the information which will be contained in the health advisories, we support the more rapid timeframe for their development in the Mitchell bill. In the case of the release of new scientific data, we recommend the EPA provide addenda to existing advisories, where practicable. Complete revisions in advisories have proven to be a most arduous and costly process. Our experiences with similar revisions of the National Ambient Air Quality Standards have shown us that complete revisions are not always necessary.

We are concerned about the enforcement mechanisms for the health advisory provision. How can we ensure this information is produced within the bill's given timeframe? We encourage the Subcommittee to monitor closely the appropriations process following enactment of this bill to ensure there are funding provisions for oversight of these and other time sensitive initiatives.

Section 12: Council on Indoor Air Quality

In examining the needs of our schools and communities, we must also focus on improving the coordination of indoor air pollution activities on the federal level. Although indoor air pollution is recognized as a public health problem, the government has not fulfilled its promise to protect the public's health from this hazard. To date, no single federal agency has been given the jurisdiction for ensuring healthful air quality in the nonworkplace indoor environment.

Let me just outline for the subcommittee the types of indoor air pollutants and their effects, in hopes of illustrating the extent of the regulatory authority we need to control indoor air pollution. While this list is not exhaustive, it describes the most common and most prominent indoor air pollutants:

- *Biological aerosols*, including aero-allergens, which are plant or animal materials, capable of sensitizing some individuals and producing allergic reactions. These aero-pathogens include bacteria, viruses, and fungal spores.
- *Formaldehyde*, an irritating and probably carcinogenic gas emitted from several types of consumer products such as particle board, plywood, insulation, and fabrics.
- *Radon*, a radioactive gas produced by the decay of uranium. Uranium is widely distributed in the Earth's crust. Radon gas decays into radioactive particles called radon daughters. Inhalation increases the risk of lung cancer.
- *Asbestos fibers*, once widely used in building materials, can cause asbestos-related lung disease, including mesothelioma and lung cancer.
- *Carbon monoxide*, an odorless gas produced in any process of incomplete combustion, such as that resulting from tobacco smoking, gas stoves, and unvented or improperly functioning heating equipment. It interferes with the supply of oxygen to the body's tissues.
- *Nitrogen dioxide*, the product of high temperature combustion, such as from gas stoves, unvented heaters, and tobacco smoking, is a respiratory irritant that may interfere with the body's defense against respiratory infections.
- *Tobacco smoke*, comprised of 4,000 chemical compounds, is a known carcinogen. It is responsible for 3,000 deaths annually in nonsmokers, and is estimated to cause 37,000 heart disease deaths and 13,000 deaths due to other cancers each year.
- *Household pesticides*, used in approximately 84 percent of American homes. Of these households, between four and five percent of the residents have experienced acute toxic reactions after using household pesticides.
- *Lead dust*, a particular danger for children and fetuses. It can cause impaired physical and mental development and acute illness in children and adults. The respiratory system is the major port of entry for lead dust particles. Absorption

levels through the lungs is 95 percent in children and infants; ingested lead contaminants only yield absorption levels of 30–40 percent.

- *Household solvents*, which commonly contain butoxyethonal and xylenes, for which there is some evidence of teratogenicity.

As you can see, this is a very diverse list and in need of more central government coordination. Yet only a few federal agencies—the EPA, the Occupational Safety and Health Administration (OSHA), the Department of Energy (DOE), and the Consumer Product Safety Commission (CPSC)—have partial authority to control indoor air pollution. Most of these agencies also participate in the Interagency Committee on Indoor Air Quality, co-chaired by the EPA and the CPSC, which coordinates national indoor air research activities.

While it is appropriate to continue this coordination of the relevant government agencies to control indoor air pollution, central authority should be given to the EPA. The central element in this program must be indoor air quality research with special emphasis on improved methods for communicating with the public regarding the health effects of and the control technologies for indoor air pollution.

S.656 is one step in this direction. It will establish a Council on Indoor Air Quality. The Council will provide full coordination of federal agency activities relative to indoor air quality, and provide a forum for resolving inconsistencies and conflicts in indoor air policy. The ALA would like to see the EPA maintain its chairmanship of the Council beyond the two years specified in the bill. We believe this agency is best equipped to improve coordination among other government entities.

Now, I would like to address briefly the provisions of the Indoor Air Radon Abatement Reauthorization Act (S. 657).

The Indoor Radon Abatement Reauthorization Act (S. 657)

Radon is a "sleeping giant." Its invisible, odorless, tasteless and it penetrates the lungs unnoticed. It enters the lung by attaching itself to tiny dust particles, or it can be inhaled in its gaseous form. Once inside the lung, radon continues to decompose, releasing fragments of radiation into the lung cavity. Radiation exposure imparts considerable damage to delicate lung tissue, and prolonged exposure can lead to lung cancer and death. The EPA estimates that 7,000–30,000 lung cancer deaths per year can be attributed to radon exposure. Though this is just an estimate of cancer deaths, most researchers agree that extensive radon exposure poses a very serious threat to human health.

With the release of the Environmental Protection Agency's recent risk assessment of environmental tobacco smoke (ETS), we also should be concerned about the increased risks posed for the average individual by exposure to a combination of ETS and radon. Considerable research should be devoted to the effects these agents have upon human health. There has been concern expressed regarding the presence of tobacco smoke in enclosed areas where high radon levels have been detected. The impact of increased concentrations of these agents and its impact on the risk or development of disease are both worthy of further investigation.

While we look to promote safer work and learning environments, we must recognize the continuing need for more research on radon gas, and the need to make this information more available to consumers. We must continue to study radon's impact on human health and ways to mitigate and limit exposure to it. We must alert consumers to its indoor air pollution risks through the active use of health advisories that include information regarding its dangers, risks of exposure, and what actions can be taken to reduce exposure to unsafe radon levels.

The ALA endorses the Indoor Radon Abatement Reauthorization Act. We are particularly pleased with its testing and real estate disclosure provisions. We believe S. 657 is a scientifically sound and reasonable approach for addressing the health effects caused by radon. The ALA firmly believes its passage will be most prudent public health policy in these critical times.

Conclusion

In closing there are several other areas that require immediate action. We desperately need to devote more research to the development of better methods for detecting and quantifying truly hazardous chemicals. Of equal importance is the need for extensive research on and the application of new techniques in epidemiology to address the problems of low and chronic dose exposures. We must also channel adequate resources to our states and local municipalities for the assessment and management of specific indoor air concerns. Periodically, we should keep Congress abreast of the progress and results of these efforts.

Mr. Chairman and members of the Subcommittee, an adequate national response to our indoor air pollution problem is long overdue. It is even more apparent as we examine our nation's indoor air quality. With increased public education and consumer awareness, organizations like the ALA, have embarked on successful efforts to address our rapidly expanding environmental needs. While these elements have proven successful, public awareness cannot be as effective without a sincere commitment from the federal government to alleviate the health risks posed by indoor air pollution.

Diverse groups, from health-oriented organizations like the American Lung Association, to chemical manufacturers and commercial builders, are urgently seeking federal action to ensure healthier and safer indoor environments in the workplace, at school, and in our homes. These groups are looking to Congress and the federal agencies for leadership. I ask the subcommittee to take the critical steps toward accomplishing this goal today.

On behalf of the American Lung Association and the American Thoracic Society, I would like to thank you for the opportunity to testify before the subcommittee on indoor air quality. Please know you have our organization's support and encouragement as you continue to review these very pressing issues.

TESTIMONY OF NANCY ALDERMAN, BILL S. 656 TO PROVIDE FOR INDOOR AIR POLLUTION ABATEMENT, INCLUDING INDOOR RADON ABATEMENT, AND FOR OTHER PURPOSES, BEFORE THE COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS, U.S. SENATE MAY 25, 1993

My name is Nancy Alderman, I am from North Haven, Connecticut. I am a board member, and past president, of the Connecticut Fund for the Environment, a present board member of the Environmental Defense Fund and a member of The Governor of Connecticut's Committee on Greenways. I want to thank you for the opportunity to testify today on this important legislation S. 656 a bill to provide for indoor air pollution abatement, including indoor radon abatement, and for other purposes.

I wish to testify on two indoor air pollution episodes that happened to me and my family and the difficulty that I faced in trying to resolve both these problems without the benefit of having any kind of legislation pertaining to indoor air pollution in place. Both episodes caused illness that came with the particular indoor air pollution problem, and in both cases the illnesses and symptoms disappeared shortly after the removal of the indoor air pollution problem.

The first episode was in a kitchen renovation of our home, and the second episode was five years later in the purchase of a new car.

First, to address the household indoor air pollution problem. In the winter of 1977, needing a new kitchen floor, we did what thousands of Americans must do everyday, we called a flooring company to install a new linoleum kitchen floor. The flooring company advised us that the best way for them to install this floor was to leave the old linoleum down and to cover it with plywood, and then to glue down the new linoleum to that newly installed plywood. Without thinking anymore about it we told them to go ahead which they did. The floor company arrived with much plywood and the linoleum. I remember noticing that the plywood smelled very badly when they stacked it up in the kitchen, but at that time I had never heard of indoor air pollution and I did not understand what a bad smelling batch of plywood could actually mean. I left the house early that morning and returned after five o'clock that evening when the floor was finished. From that moment on I had severe problems that I could not figure out what they were, and what needed to be done about them. From the moment of that floor installation the air in the kitchen never felt the same again.

When I would be in the kitchen for a period of time my eyes would burn and become uncomfortable. I noticed that when other people would come into the kitchen and stay for a period of time they would begin to rub their eyes.

At this time, in 1977, I was simply a private citizen, with no environmental background and no knowledge of toxics and their affect on the body. I could find no one who could enlighten me as to what was going on in my house, and in fact, people responded to me at this time with comments such as they never heard of a house making anyone sick.

My symptoms increased. From having just my eyes burn, I also started to get swollen bronchial tubes. By this time two and a half months had elapsed and we were due to go away for two weeks in March on a family vacation. During this period away from the house my symptoms disappeared. When we returned, the symptoms returned in the same way they had been there before our vacation. At this point I became very concerned. As well, our younger child's bedroom is located at the top of the back stairs leading to the kitchen, and he too was now beginning to have symptoms. Although he did not spend as much time in the kitchen as I did , the proximity of his bedroom to the kitchen caused him to have an exposure level that was enough to cause his sinuses to become swollen.

Finally, in desperation, I called a family friend who was a doctor and an eye surgeon. I asked him as a favor and as a friend, if he would come over to our house and sit in our kitchen to help me problem solve with what to do with this issue that was fast becoming a serious health problem. He agreed to come, and said he would bring his wife as well, because she used contact lenses and that made a persons' eyes even more sensitive to pollutants.

Doctor Jerome Freedman of New Haven, after spending just a little under an hour in our kitchen, stood up and said we had to remove the kitchen floor and its plywood underlay. He then told me what I had not known, that between 1956 and 1958 he had been an United States Air Force flight surgeon, and during that time he had a number of pilots who got sick every time they went up in their planes. He tracked their illness to their reconstructed oxygen masks that had used a glue that was causing the pilots to get sick. He said when he got the masks replaced there were no further problems. He said he did not have instrumentation to know exactly what was used in the plywood or the adhesive of our flooring, but that it did not matter. He could tell there was definitely an air problem in our kitchen and that what did matter was that we get rid of the cause, and that was obvious to him to be in the flooring. During the hour he and his wife spent in our kitchen his wife had to remove her contact lenses in approximately one half hour.

With that strong opinion from a medical person I had faith in, we removed our kitchen floor at a cost of three thousand dollars in 1977 dollars which we had to bare the cost. Had we not been able to personally take that loss, I to this day, do not know what we would have done. Although there was no way to get documentation in 1977, I am sure now that the problem was in the plywood. Plywood is put together with formaldehyde glue and in 1977 there were no standards for formaldehyde in plywood and the plywood industry was not self regulating itself in a meaningful way. We were unfortunate in that we had a bad batch of plywood installed in the kitchen that was out gassing formaldehyde in a period of time when no one knew of such things or how to deal with such matters. Besides the adverse health affects on myself and our son, need I describe what something like this does on the stress level inside a family. During part of this time when my symptoms became very uncomfortable and I wanted relief from the swelling of my bronchial tubes, I went and lived with my parents for a week. This was a difficult time.

My second episode with indoor air pollution was very different. This next experience addresses the serious problems we have in some of our automobiles. Fortunately, I have all the documentation on this air pollution problem.

In 1983 we purchased a 1983 Malibu Chevrolet Station wagon. We special ordered the car and when it came into the dealership we picked it up and paid in full for it with a check, including the state sales tax. The dealership is approximately six miles from our house. From the time I got in the car at the dealership, until the time I pulled in our driveway, every mucous membrane above my neck was internally swollen. The car had a severe air pollution problem, of which I suspected formaldehyde, from my earlier experiences. but there seemed to be other things going on as well.

The first issue was what to do about the car. After leaving the windows open to let "the New Car Smell" out, I tried the car the next day. After three days, with the symptoms not improving , I called the car dealership to tell them their car was making me sick. They said that was impossible and that if I wanted to return the car I could, but that I would loose the state sales tax, as well as $ 1,500.00 because even though the car had only 36 miles on it , it was now in fact a used car.

Having a car I could not drive, not being able to return the car without loosing many thousands of dollars, and having had a previous air pollution problem,and now being on the Board of The Connecticut Fund for the Environment, I knew who to call for help in Connecticut. In 1983 Alan Siniscalchi was Acting Chief of the Toxic Hazards section of the Department of Health in the State of Connecticut. He told me that the state had just mandated that there were not enough funds to go out and test indoor air pollution problems that did not affect many people at the same time. However, even though this car was affecting just one family, because the Chevy Malibu Wagon was such a popular car he felt the state could argue that the information gained from this car would be very valuable because so many people in fact own new Chevrolets.

And so the State came and tested my car, and I am therefore able to provide complete documentation of the air pollution that existed in this car and the seriousness of that air pollution. At the same time I can testify why the state was not able to remedy the situation even though they thought this to be of the outmost concern and even though they genuinely wanted to fix this outrageous problem.

I am submitting the report in total with my testimony, but I will summarize the findings now. The car was out gassing ten (10) times the limit of formaldehyde that the Federal guidelines said that humans should be exposed . In 1983 the guidelines for formaldehyde exposures in homes in Connecticut were at 0.03 ppm. My car was over ten times that level at 0.4 ppm. To quote the States letter, "...adverse health effects were occurring among individuals exposed to formaldehyde concentrations as low as 0.03 ppm.

Besides the very high levels of formaldehyde, the 1983 Chevrolet Malibu Station Wagon also had high levels of Benzene, Toluene, and related M-xylene and 0-xylene, all neuro- toxins. The State of Connecticut letter describes Xylene and Toluene as " central nervous system depressants ".

Now that I had documentation on the car , and this documentation proved that the car indeed had a severe interior air pollution problem with the potential for adversely affecting human health, the car dealership would definitely not take the car back. They said the car was defective and they could never resell it. Because the car had a proven defect, the dealership would give me no money back at all for the car, and they said the issue must now be taken up between the manufacturer, General Motors, and ourselves.

We argued with General Motors from June until August of 1983. Only when I threatened to have a press conference releasing the information about the air pollution problems of the Malibu interiors did General Motors agree to take the car back and returned our money.

But what about solving the larger issue. How to fix all the General Motors cars. Why should anybody be exposed to toxins at this level. As a private citizen I could never get this problem fixed.

Alan Siniscalchi told me just on May 16. 1993. that the State had considered this a major problem, but the State neither had the authority nor the resources to solve this problem. That is what is going to make this bill S. 656 so important, and why I cared enough to fly to Washington at my own expense, and testify today.

Using this example as a case study let me briefly show why this problem could not be fixed by me, a private citizen, and then why the State could not fix it, and then why this Bill must pass so that people have the protection they deserve and that the States have the tools they need to protect their citizens.

First, I tried to fix the problem. Dr. Robert Frosch was head of General Motors research division. I had a good friend who was the Dean of the Yale Graduate School and he sat on the Board of Woods Whole with Dr. Frosch. He was sure that Dr. Frosch would be in a position to help fix the problems at General Motors as I described them. I called Robert Frosch, and explained I wanted nothing other than to solve the indoor air problem in the General Motors cars. I told him I had complete documentation on what the problems were and that I would send them to him, which I did do. He listened to me and then ended the conversation. A month later I got a letter from the Public Relations Department of G.M. telling me that cigarette smoke had formaldehyde in it. Because I do not smoke, and because that had nothing to do with what I was trying to tell General Motors, I knew this was a hopeless approach.

I then tried the Center for Auto Safety in Washington D.C. They said their budgets had been cut, and that they did very little testing and what they did do had to do with accidents, not with the problems of indoor air pollution in automobiles. I was at a dead end.

Alan Siniscalchi at the State said the State Health Department was shocked and surprised in 1983 to see the levels of neuro-toxins and formaldehyde in the Chevy Malibu Wagon, but because all standards were informal, the State could not force General Motors to look at their indoor pollution problems. He said without formal Federal guidelines for exposure limits the State did not have this Authority to affect change. This bill speaks to this very issue.

The problem of indoor air pollution in buildings, homes and cars is a major problem. However, it is one of our solvable problems. Bill 656 goes a long way toward solving the most pressing issues concerning this problem. If this Bill does not get passed, you can multiply my two stories a million times, only most people will not be able to solve these problems and they will simply get sick. The reason I say this is the story of my car was published in the New Haven Newspaper and when the story came out I got more calls than I could handle from people with similar problems, all of which of course I could not help. You are in the fortunate position of being able to help. Please do so by passing this Bill.

Thank you for this opportunity.

Nancy Osterweis Alderman

STATE OF CONNECTICUT
DEPARTMENT OF HEALTH SERVICES
BUREAU OF HEALTH PROMOTION & DISEASE PREVENTION

August 8, 1983

Nancy Alderman
1191 Ridge Road
Hamden, CT 06517

Dear Mrs. Alderman:

I am writing to report the results of the air tests conducted in your car, a 1983 Chevrolet Malibu Classic station wagon located at 396 St. Ronan Street, New Haven. All samples were analyzed by the State of Connecticut Department of Health Services Laboratory Division. The results are as follows:

May 2, 1983

Lab #	Collectors #	Location	Results in ppm*
7900	5-2-5A	Blank	No volatile organic substances were found
7901	5-2-5B	Front floor passenger side	pentane 0.109 benzene 0.053 toluene 1.23 m-xylene 0.272 o-xylene 0.069

May 24, 1983

Lab #	Collectors #	Location	Results in ppm*
8317-8318	5-24-LA-LB	Center back seat	formaldehyde 0.4

June 7, 1983

Lab #	Collectors #	Location	Results in ppm*
8380	6-7-LD	Front floor Passenger side	pentane 0.199 isooctane 0.016 benzene 0.045 decane 0.131 toluene 1.04 p-dioxane 0.281 xylenes 0.565 (10 small peaks were not identified)
8381	6-7-LE	Blank	No volatile organic substances were found
8382-8383	6-7-LF-LG	Center back seat	formaldehyde 0.03

*parts per million

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Results and Conclusions

Our sampling has revealed presence of formaldehyde and hydrocarbons in the air inside car possibly as a result of out gassing from interior components (i.e., rugs, vinyl and plastics). The decrease in test results from May to June is probably due to the decrease in interior temperatures.

The results of the formaldehyde air samples can be considered in relation to information accumulated by the U.S. Consumer Product Safety Commission on the risk of acute injury from exposure to formaldehyde released from urea-formaldehyde foam insulation (UFFI). Results from both controlled exposure studies and home exposure studies have revealed that adverse health effects were occurring among individuals exposed to formaldehyde concentrations as low as 0.03 ppm. Moreover, the Committee on Toxicology of the National Academy of Sciences also concluded that on the basis of available data, there is no population threshold for the irritant effects of formaldehyde in humans.*

A comparison to the results of these studies shows that the formaldehyde concentration measured in your car is within the range which has been associated with adverse symptoms.

Recent studies have shown formaldehyde to be carcinogenic in rats and mice**. Although the carcinogenic risk to humans is not yet known, we recommend that individuals limit their exposure to formaldehyde. In addition, the presence of benzene (a human carcinogen) was detected in both the May and June sampling. The other hydrocarbons detected are not classified as carcinogens at this time. However, specific hydrocarbons (toluene, xylene) are central nervous system depressants and can cause headaches, dizziness, weakness, drowsiness, and nausea.

You may want to test the car for other upper respiratory irritants associated with plastic emissions such as polyvinyl chlorides and phthalates. I have enclosed a list of commercial laboratories who can conduct the testing.

Please feel free to contact our department if you have any questions regarding this matter.

Sincerely,

Laurie Ingels

Laurie A. Ingels
Epidemiologist
Toxic Hazards Section

LAI/kcg (3P)
Enclosure

*CPSC (Thurs. Feb. 5, 1981), "UFFI Proposed Ban; Denial of Petition", Federal Register 46(24): 11188-11211.

**I.J. Selikoff et. al., Carcinogenicity of Formaldehyde: Final Report (Report to the American Cancer Society, 25 February 1981).

TESTIMONY OF LYNN RHINEHART, OCCUPATIONAL SAFETY AND HEALTH SPECIALIST

I appreciate the opportunity to appear here today to discuss the AFL-CIO's views concerning indoor air quality and to express our support for S. 656, the Indoor Air Quality Act of 1993. Those in the labor movement who have been working for years to find solutions to indoor air quality problems welcome the recognition and attention to the issue that this legislation provides.

The 86 unions of the AFL-CIO represent approximately 14 million workers, many of whom work inside buildings that have indoor air quality problems. As such, indoor air quality is an issue of great interest and concern to AFL-CIO members. In fact, for some of our affiliated unions, indoor air quality is the occupational safety and health issue about which they receive the most complaints and requests for assistance.

Our affiliated unions receive countless calls from their members who are suffering from the allergy-like symptoms and other disorders that poor indoor air quality can cause. A recent survey conducted for the American Federation of Government Employees found that over 50 percent of respondents reported experiencing health symptoms that are typical of sick building syndrome. Half of those who experienced problems were treated by a health professional. Fifty-four percent of workers who experienced problems lost time from work because of the problem. In addition, a number of our unions have had incidents where members have become seriously ill or have died due to indoor air pollution. A member of the Service Employees union lost most of one lung due to exposure to a rare fungus that was found in the poorly-maintained ventilation system where he worked. And you may recall the incident two years ago at a Social Security Administration building in Richmond, California, where a worker died and many others were made ill from Legionnaire's Disease due to bacteria that were spread throughout the building through the ventilation system. An emerging indoor air threat is tuberculosis, which can be transmitted through the air. Healthcare workers in Florida, New York, and other areas have contracted TB because of bacteria being transmitted through the air from TB-infected patients.

In addition to the health problems that poor indoor air quality can cause, bad indoor air is responsible for a significant loss in worker productivity, which translates into enormous costs to businesses and our nation as a whole. The EPA estimated in its 1989 Report to Congress that poor indoor air quality costs tens of billions of dollars each year in medical expenses and lost productivity. Other surveys have found that anywhere from 25 percent to 50 percent of workers take at least one day off from work each year due to ailments caused by indoor air pollution. When you multiply these figures by the population working in the estimated one million buildings with indoor air quality problems, you see that poor indoor air quality is causing a tremendous drain on our economy, in addition to the impact on human health.

Responding to the broad range of problems caused by poor indoor air quality and the diverse possible causes of poor indoor air quality, unions have worked to develop practical and effective solutions to indoor air quality problems. This presents a number of challenges, including:

1. *Defining the health conditions caused by indoor air pollution.* Many times when union members complain of health symptoms, such as eye, nose and throat irritation, headaches, fatigue, dizziness or disorientation, these symptoms are interpreted as subjective responses not associated with a specific physical agent present in the workplace. There are many possible causes of the health symptoms, including exposure to spores or fungi being blown through poorly cleaned and maintained duct work, or reactions to formaldehyde being emitted from new carpets or curtains, or residue of pesticides used to fumigate offices, or paint vapors. It is often nearly impossible to demonstrate a decisive cause and effect relationship between the culprit and the response. In addition, the symptoms may be produced by a combination of air contaminants, coupled with insufficient oxygen that produces a general malaise.

These health complaints will often be ignored because the health symptoms do not translate to a diagnosable illness or cannot be attributed to a particular cause. Such is often the case with occupational illnesses. Unfortunately, building owners or employers will often say that because there is not a specific ailment traced to a specific substance, that the problem is with the worker and not with the air quality. This results in great frustration among the affected workers, and can sometimes make workers even more anxious about their symptoms.

2. *Quantifying and identifying the causative agents.* Finding the culprit behind workers' symptoms can be a difficult task. Climatic conditions and maintenance procedures, work practices, remodeling, or malfunctioning equipment all might be rea-

sons why air quality is poor. These conditions and activities may vary daily or seasonally. Exposures to contaminants generated from these activities also vary and may be quite elusive. Industrial hygiene tools for monitoring air contaminants might not be accurate at low exposure levels, nor capture the multiple agents present in the air.

Industrial hygiene exposure thresholds for airborne contaminants were developed for industrial situations where hazards like welding fumes, paint vapors or dust levels are generated from a particular workplace activity. Therefore, monitoring takes place at the source where the hazard is generated such as where a worker is welding or painting or grinding. By contrast, indoor air pollution is a ubiquitous presence that fluctuates often with conditions outside of the control of the workers themselves. Therefore it is difficult to know when and how to sample a particular contaminant. Sometimes the traditional industrial hygiene techniques simply do not work for indoor air quality problems, but a systematic approach to investigating along with some common sense, often do.

3. *Finding remedies that work.* With the indoor air quality issue, there tend to be two different views on how to approach the problem. Some favor a contaminant-by-contaminant source control approach, while others prefer a "building systems" approach. The "contaminant-specific" proponents argue for research into the identification and isolation of the particular agents causing the problem, before action is taken to eliminate the problem. The "building systems" group argues that proper design and functioning of ventilation systems can alleviate most indoor air quality problems, even if a specific causative agent is not identified. The unions of the AFL-CIO tend to fall into the "building systems" camp because this approach is more pragmatic and leads to faster results. With members who are ill, suffering the effects of poor air quality, we do not have the luxury to argue for more research, when potential remedies are available. If we can determine the causative agent, then by all means we should work to eliminate it. But we also want to act to prevent and solve problems even without knowing the particular agent causing the problem.

The unions of the AFL-CIO have been successful, in some cases, in pushing employers to take action to address poor indoor air quality. Often times measures such as better design or maintenance of building ventilation systems prove effective in reducing worker complaints of health problems. For example, the Service Employees union represents workers at a mental health facility in Westfield, Massachusetts. The building is a converted factory, and indeed the first floor of the building is still being used for industrial purposes. Chemicals were seeping from the factory into the mental health facility. Levels of chemicals were detected but did not exceed OSHA's permissible exposure limits. The building had serious problems with its ventilation system, which did not provide enough fresh air and which was installed improperly so that the air intake and exhaust were in the same location. This means that the building intake kept taking in the polluted air from the exhaust fan and recirculating the same polluted air around the building. The union was able to persuade management to increase the air flow and to improve the sealers between the first and second floors of the building. Worker complaints were greatly reduced as a result. Similarly, at a high school with indoor air quality problems in Ridgefield, Connecticut, the union was able to get management to increase air flow, which alleviated the problem. And at a community college in Manchester, Connecticut, the union made recommendations to the employer that led to employee training, adjustments to the ventilation system operations, and new ways to use cleaning chemicals to reduce exposure. The moral of these stories is that practical solutions are at our fingertips now to address many indoor air quality problems. However, the response to date by both government agencies and by building owners and employers has been inadequate, and additional efforts are needed to protect workers and the public from indoor air pollution.

Turning to S. 656, the AFL-CIO supports this legislation because we believe the various initiatives proposed in the bill will both give greater visibility to the indoor air quality issue as well as provide for a more vigorous federal response to the indoor air quality problem. We strongly support section 14, the building assessment demonstration program to be conducted by the National Institute for Occupational Safety and Health. NIOSH is the principle federal agency responsible for research on workplace safety and health. NIOSH has conducted hundreds of health hazard evaluations in buildings with indoor air quality problems, which have been very helpful in identifying possible causes of indoor air pollution and recommending possible solutions. We strongly support Section 14's provisions giving NIOSH explicit authority to continue and expand their activities in this area, in addition to authorizing greater resources for these activities. We would suggest that the legislation be amended to include among the "Assessment Elements", an assessment of the building ventilation system, to see if inadequate ventilation or lack of maintenance of the ventilation system could be a contributing cause of indoor air quality problems. NIOSH has found heating, ventilation, and air conditioning (HVAC) system problems to be a cause of poor indoor air quality in more than 50 percent of the buildings they have investigated. It would be unfortunate if the legislation did not specify that NIOSH should take this factor into account when doing its building evaluations.

Other elements of the legislation of particular interest to us are the Federal Building Response Plan and Demonstration Program set out in Section 9, along with the requirement that NIOSH develop and implement a training program for designated personnel responsible for overseeing federal building indoor air quality programs.

While the AFL-CIO supports the Indoor Air Quality Act overall, we have two general concerns about the bill. First, the legislation is more research-oriented and less action-oriented than we would ideally like. As I previously described, practical solutions are available now to address many indoor air quality problems. The technical bulletins authorized by the legislation are a good first step toward developing and disseminating information broadly on steps to remedy indoor air quality problems. Still, we believe that more than recommendations are needed. We believe that the data and the information exists currently to develop enforceable regulations covering indoor air quality in workplaces. We need regulations and technical assistance to employers and workers to set in place a more proactive, preventive response to the indoor air quality problem. Of course research into the causes and effects of indoor air quality problems should continue, but we believe sufficient information exists to develop and implement regulations now, without waiting for the definitive research to be completed. I would like to submit for the record a copy of draft regulations being developed by the state of Washington as an example of the types of practical solutions that are being worked on currently.

The AFL-CIO and its affiliated unions have been pushing the Occupational Safety and Health Administration to promulgate regulations on indoor air quality in the workplace. The AFL-CIO and 14 of its affiliated unions petitioned OSHA in March 1992 for a comprehensive indoor air quality standard. I would like to submit a copy of the unions' petition for the record. We have proposed that OSHA develop a broad, performance-based standard to require employers to develop a program for dealing with indoor air quality in the workplace. The unions' petition and other petitions on this issue are awaiting a decision by OSHA as to how they will proceed in this area. We would strongly support adding a provision to this legislation directing OSHA to promptly proceed with regulations on workplace indoor air quality. Congress has followed such an approach on numerous occasions, including the Superfund reauthorization's mandate that OSHA develop regulations on hazardous waste operations, the Clean Air Act's mandate that OSHA develop regulations on chemical process safety, and the recent Housing bill's mandate that OSHA develop regulations to protect construction workers from lead exposure. We would be pleased if a similar mandate for indoor air quality regulations was included in S. 656.

Our second concern is that the legislation does not fully recognize or appreciate the important role that the Occupational Safety and Health Administration has to play in developing a national response to the indoor air quality issue. Workplace exposures are a very important part of the indoor air quality problem. In fact, workers may well be exposed to poor indoor air quality more than any other population. While OSHA's actions in the area of indoor air quality have been disappointing to date, it is OSHA's rightful mission and OSHA's legal responsibility to protect worker safety and health. The legislation recognizes that OSHA has a role in the federal indoor air quality program, through its language requiring EPA to consult with OSHA over various aspects of the program. However, the legislation plainly puts EPA in the lead, and seems to allow EPA to determine what should be done in the area of worker safety and health and even to determine what OSHA should do with OSHA's legal authority. While EPA has been more active than OSHA on the indoor air quality issue to date, EPA is not particularly well suited, nor was it established, to deal with workplace issues—that is OSHA's responsibility. We believe that the legislation could be improved by spelling out more clearly OSHA's authority and responsibilities in this area. We would be happy to work with the committee to assist in developing appropriate language.

In sum, we believe S. 656 is an important piece of legislation that will help to bring greater attention to the indoor air quality problem, and to foster greater efforts to promote clean indoor air. The inclusion of our suggestions would greatly strengthen the bill as it pertains to worker safety and health. Thank you for the opportunity to present these views. I would be pleased to answer any questions you may have.

TESTIMONY OF PAUL CAMMER, PRESIDENT, BUSINESS COUNCIL ON INDOOR AIR

Introduction

The Business Council on Indoor Air (BCIA) appreciates the opportunity to present its views on the Indoor Air Quality Act of 1993 (S. 656). BCIA represents a wide spectrum of industries interested in indoor air quality. Our membership is composed of firms with analytical and engineering expertise in monitoring, controlling, and improving the quality of the indoor environment, companies that are owners of and/or tenants in a wide variety of commercial buildings, and manufacturers of chemicals, consumer products, and building materials.

BCIA agrees with the sponsors of this legislation that protecting indoor air quality is of primary importance. BCIA further agrees that federal resources should be directed at identifying indoor air quality problems and at finding the most efficient methods to remedy those problems.

In light of existing federal authorities and programs, BCIA questions the need for indoor air legislation. This is particularly true if the Occupational Health and Safety Administration (OSHA) proceeds toward a general indoor air quality rulemaking that would ensure proper operation of building systems. We do not oppose legislation, however, that would better clarify and coordinate federal research and other activities directed at cost-effective solutions to indoor air quality problems.

This testimony discusses the general issues relating to a federal indoor air quality strategy and the specific issues raised by the provisions of indoor air legislation that has been introduced in 103d Congress. In this testimony, we will discuss the overall approach to addressing indoor air quality, the need for additional research on indoor air pollution, and the appropriate nature of any regulatory initiatives and public communications regarding this issue. While the details and examples presented in this testimony relate to commercial office buildings, the principles described herein are generally applicable to residences and other indoor situations as well.

Overview of Building-Systems Approach

Two of the most common factors in buildings with reports of poor indoor air quality are inadequate ventilation and poor filtration. Ventilation problems, in turn, can result from insufficient outdoor air intake and/or poor distribution of that air. Inadequate filtration is frequently a major contributor to the third most common problem: the accumulation of dirt, dust, and microbes inside the air handling units and their associated duct work. A 1988 study by the Walter Reed Army Institute found that the incidence of respiratory infection was 50 percent higher in modern, energy-efficient buildings than in older, less airtight buildings.[1] According to the National Center for Health Statistics, such respiratory ailments accounted for one half of all absenteeism of the U.S. labor force between 1983 and 1985.[1]

In a 1987 report, the National Research Council (NRC) noted the complexities associated with identifying the source of occupant symptoms and complaints related to indoor air quality problems and concluded that:

> The levels of both chemical and biological contaminants are strongly associated with the cleanliness of the heating, ventilation and air conditioning system.[3]

The U.S. Environmental Protection Agency (EPA), in its 1989 Report to Congress, further noted that "more can be done to reduce overall exposures and risks by altering building designs and ventilation patterns than by approaching the problem source-by-source or pollutant-by-pollutant." [4]

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[1] Brundage, J. et al., 1988, Building-Associated Risk of Febrile Acute Respiratory Diseases in Army Trainees, J. Am. Med. Assoc., 259(14): 2108–2112.

[2] National Center for Health Statistics, 1989, Vital and Health Statistics—Health Characteristics by Occupation and Industry: United States, 1983–85, Series 10, No. 170, Page 25.

[3] NRC, 1987, Policies and Procedures for Control of Indoor Air Quality.

[4] EPA, 1989, Report to Congress on Indoor Air Quality, Volume III—Indoor Air Research Needs, Page 3.

BCIA agrees with the conclusions of NRC and EPA, and has strongly supported the development of a "building-systems" approach to addressing potential indoor air quality problems. Such an approach focuses on the design, maintenance, and operation of ventilation, filtration, and other building systems, and encompasses the principles of several of the standards and guidelines developed by the American Society of Heating, Refrigerating and Air Conditioning Engineers (ASHRAE), including ASHRAE Standard 62–1989. Among its provisions, ASHRAE Standard 62–1989 increases the minimum ventilation rate to 20 cubic feet per minute of outside air per person (cfm/person) from the previous recommendation of 5 cfm/person for office space.[5]

The building-systems approach to indoor air quality is not just a matter of increased ventilation, however, but a comprehensive process that promises to improve air quality indoors with a minimum of expense and regulatory effort. In the case of new buildings, this approach commences at the building-design stage, continues through the construction and commissioning stages, and includes proper operator training and effective building operation and maintenance throughout the entire life of the building. For existing buildings, it includes testing, maintenance, and possible redesign of ventilation, filtration, heating, and air conditioning systems.

A large body of experience from public and private organizations supports the building-systems approach. Extensive field experience in recent years has shown a very high level of success when applying these principles. Application of this approach has already proven itself to be the most economical and effective means of immediately making indoor environments more pleasant places to work. Because of its potential to address the majority of potential indoor air quality problems in the most cost-effective way, the building-systems approach also should receive high priority in federal indoor air research programs.

BCIA considers the building-systems approach to be an important management tool that should be applied to both existing and planned buildings. We support the development of a uniform criteria relating to proper design and maintenance of building design and engineering and the benefits of flexibility. We wish to note that such a process already is underway as an increasing number of regional and state building codes have adopted technology guidelines consistent with the ASHRAE Standard.[6] If a formal, technology-based standard is to be pursued, we believe a well-coordinated, joint effort among the key federal agencies is essential. In fact, we have encouraged OSHA to begin such a program under its existing authority, and it is our understanding that an OSHA rulemaking on indoor air quality may be initiated in the near future.

Importance of Ventilation

The solution to indoor air quality problems often has been characterized, unfortunately, as a choice between increased ventilation and the control of contaminant sources. While it is clear that a variety of measures may be necessary to maintain acceptable air quality in certain circumstances, adequate ventilation must remain a cornerstone of any indoor air quality strategy. The value of ventilation can be seen in Figure 1, which plots carbon dioxide (CO_2) concentration versus ventilation rate in a typical office environment. These data were derived from Appendix D of ASHRAE Standard 62-1989, and form the basis of the standards' recommended 20 cfm/person of outside air for general office space. As you will note from Figure 1, there is a very rapid drop-off of CO_2 concentration up to a ventilation rate of 20 cfm/person and a much slower decrease in concentration at ventilation rates above 20 cfm/person. The ASHRAE recommendation for minimum ventilation rate in offices, therefore, provides for optimum dilution/removal while minimizing energy costs.

While CO_2 is not an indoor contaminant of concern, it is sometimes used as a surrogate for other gaseous compounds in indoor environments. The concentration profiles for most volatile organic compounds (VOCs), radon, and many particulate contaminants (including some bacterial pathogens) demonstrate similar response patterns.

Recent data collected by researchers at McGill University, and published in the *New England Journal of Medicine*, [7] concerning the relationship between ventilation rate and the incidence of symptoms generally attributed to "sick building syndrome," however, has been incorrectly and inappropriately cited as indicating that ventilation is not effective in improving indoor air quality. While the data from this study suggest that increasing the ventilation rate beyond those levels recommended in ASHRAE 62-1989 did not reduce occupant complaints, the study did not investigate the far more relevant question—what are the benefits of increasing ventilation rate from the previous ASHRAE level of 5 cfm/person to 20 cfm/person. As indicated in Figure 1, it is in this lower range that one would expect to find occupant complaints.

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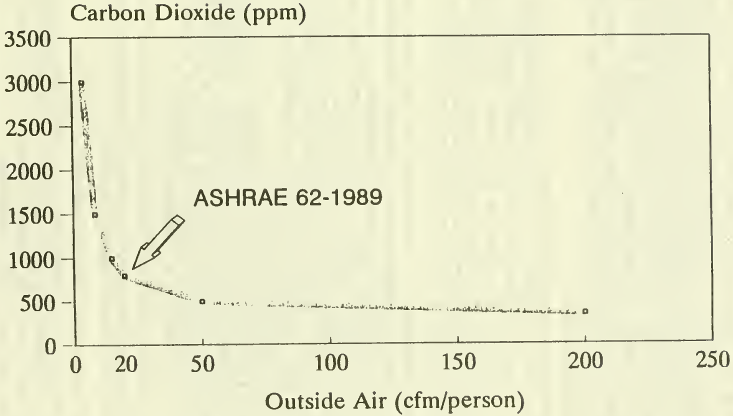
[5] ASHRAE Standard 62–1989, Ventilation for Acceptable Indoor Air Quality.

[6] In most cases, these codes do not encompass the operation and maintenance of building systems, and further efforts to encourage a uniform approach to this issue would be helpful.

[7] Menzies, R. et al, 1993, The Effect of Varying Levels of Outdoor-Air Supply on the Symptoms of Sick Building Syndrome, N. Eng. J. Medicine 328(12): 821–827.

FIGURE 1.
Relationship of Carbon Dioxide
to Ventilation



Assumptions: 7 persons/1,000 sq. ft.; outdoor CO_2 = 350 ppm; sedentary office staff.

It is important to note that the buildings investigated in the study were not what would generally be considered sick buildings, and the significance of the study's findings in the context of public policy decision making is highly questionable.

Energy Impacts

Without doubt, the major obstacle to implementation of a building-systems approach is the misperception that the increased ventilation aspects of such an approach will result in a significant increase in energy consumption and costs. While the numbers will vary, depending on where the building is located and on the efficiency of its heating, ventilation, and air conditioning (HVAC) system, the energy costs required to meet ASHRAE 62–1989 generally are not substantial.[8] In fact, the Bonneville Power Authority has concluded that ASHRAE 62–1989 has a minimal impact on energy use and energy cost regardless of building type or location.[9] Moreover, heat-exchanging technology has been developed, and is commercially available, that can further increase energy efficiency and reduce energy costs.

Source Management

BCIA recognizes that not all indoor air quality problems may be solved through improved design, operation, and maintenance of building systems. In some situations, it may be necessary to manage specific sources in order to ensure adequate indoor air quality. This often can be achieved through proper scheduling of renovation, maintenance, and cleaning activities, air cleaning, and enhanced local ventilation. In the cases of asbestos and lead in paint, however, conventional wisdom now tells us that removal may create a greater health risk than leaving the material in place.

In addressing indoor air quality problems, BCIA strongly recommends a two-phase program that first implements and evaluates the effectiveness of the building-systems approach (including prudent management of sources) before significant resources are devoted to source- or pollutant-specific control measures. If such a program is not pursued, two sources of inefficiency and delay would be created: (1) pollutants that become insignificant with adequate building systems would be regulated unnecessarily, and (2) it would be necessary to develop a risk assessment framework for the evaluation of simultaneous exposures to low levels of multiple indoor air contaminants from multiple sources.

No adequate framework has been developed or validated to reflect actual human risk from low levels of exposure to pollutants in changing indoor environments, and it is very unlikely that one can be developed in the near future. Consequently, BCIA generally does not regard a source-by-source or pollutant-by-pollutant approach to be the most cost-effective method for improving general indoor air quality in the majority of commercial or residential buildings.

Review of Key Provisions of Senate Indoor Air Quality Proposal

The remainder of BCIA's testimony is devoted to comments on several specific sections of the Senate indoor air legislation.

Section 5—Indoor Air Quality Research

We fully agree that further research on indoor air quality is needed. We believe, however, that research and mitigation efforts should be prioritized and focused so that the most promising steps to protecting and improving indoor air quality can be identified, evaluated, and implemented.

It is essential that the many public information, research, and mitigation programs now underway, and those planned for the near future, be coordinated to provide the most valuable information for improving indoor air quality in a cost-effective manner. A fundamental step in that coordination effort is the setting of realistic priorities so that the limited federal funds available are used in the most efficient way possible. In our 1989 comments to EPA's Science Advisory Board on research needs for indoor air quality, we urged that the Agency adopt criteria for setting priorities based upon sound scientific principles, and that these criteria be applied in such a way that the projects yielding the most timely and useful information are funded first.

Clearly, the most important and cost-effective step toward preventing, mitigating, or eliminating indoor air quality problems is improvement of building-systems design, operation, and maintenance. Because a source-by-source or pollutant-by-pollutant approach is fraught with inefficiencies and scientific problems and uncertainties, BCIA strongly recommends that research funds should be directed first toward strategies that have been demonstrated to provide practical, effective, and permanent solutions. Improvement of ventilation and filtration is one such strategy.

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[8] Eto, J.E. and C. Meyer, 1988, The HVAC Costs of Fresh Air Ventilation, ASHRAE Journal, September.

[9] Steele, T. and M. Brown, 1990, Energy and Cost Implications of ASHRAE Standard 62–1989, Report prepared for the Bonneville Power Authority, January 15.

Building-Systems Research

While much is known about the potential for the building-systems approach to eliminate or mitigate potential indoor air quality problems, additional research is necessary to refine our understanding of the application of these measures. Among those areas requiring additional research, BCIA includes ventilation optimization, filtration, air cleaning, and the relationship between indoor air quality and worker productivity.

In this area, research that can be conducted in cooperation with the private sector should be given high priority. Such research will promote (a) non-adversarial partnerships between government and industry, (b) development of, and access to, highly advanced technology in industry, and (c) credibility in project planning, implementation, analysis, and interpretation.

Healthy Buildings Baseline Study

Monitoring data collected over the past ten years by EPA show concentrations of some contaminants to be considerably higher indoors than outdoors. These studies, such as EPA's Total Exposure Assessment Methodology (TEAM) research program,[10] have not addressed the broad range of indoor air contaminants, however, nor have they incorporated consideration of ventilation conditions and other mechanical systems in the buildings in which the measurements were taken.

Without the knowledge of the ventilation and other building systems at monitoring sites or the health and comfort of occupants, it is difficult to assess the significance of TEAM and other data to evaluate potential remedial actions. It is equally difficult to assess the contribution of particular sources of contaminants without first developing some baseline against which it can be compared.

To establish an acceptable baseline for comparing and assessing indoor monitoring data, BCIA proposes the development of a federal research project to evaluate indoor air quality in buildings that comply with the generally accepted principles incorporated in our building-systems approach. Such a program to be conducted by EPA and the National Institute for Occupational Safety and Health (NIOSH) in cooperation with private industry, would build on the existing research to include the following significant additions: (1) the buildings to be sampled would be selected on the basis of compliance with the building-systems approach, and (2) the list of contaminants to be monitored would be expanded to include biological contaminants, respirable particulates, carbon monoxide (CO) and CO_2. The study also should include an evaluation of the buildings' indoor air quality histories, including the health and comfort of building occupants.

Such a study of indoor environments would provide the much needed baseline data for evaluating indoor air quality. BCIA wishes to note that provision for such a baseline study is included in indoor air legislation recently introduced in the House (H.R. 1930), and EPA currently plans to begin research similar to that outlined above later this fiscal year.

Biological Contamination

Biological contaminants in industrial and non-industrial environments encompass a wide range of pollutants including bacteria, fungi, viruses, exoskeletons of mites and insects, animal dander, and dead human skin tissue. Microorganisms can survive and grow in numerous indoor environments that provide moisture and nutrients. The effect of biological contaminants on human health is dependent on the type and magnitude of contamination and on individual susceptibility.

There is an abundance of data indicating that microbial contaminants are a major contributor to indoor air problems. Recent information collected by the Consumer Product Safety Commission (CPSC) indicates that 30 to 50 percent of all structures have damp conditions that may encourage the growth of biological pollutants.[11]

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[10] Wallace, L.A., 1987, The Total Exposure Assessment Methodology (TEAM) Study: Summary and Analysis, Vol. I, EPA Office of Research and Development, EPA/600/6-87/002a.

[11] CPSC, 1989, Summaries of Workshop on Biological Pollutants and Asbestos Abatement in the Home.

Data from BCIA members and other private firms indicate that biological contamination may be the cause of 40 to 50 percent of the indoor air problems in commercial buildings. One of BCIA's member companies has tabulated its experience in indoor air analysis and mitigation over the past 10 years. Figure 2 shows the primary contaminants identified in investigations of about 700 commercial buildings worldwide.

Despite its apparent importance, there is insufficient information about the extent, routes of exposure, and health consequences of microbiological contamination within buildings. Given that great variations occur with regard to the numbers of a particular species of microbes required to trigger infections of allergic reactions, compounded with the variability of individual susceptibility, research is needed to elucidate the role of microbes in the indoor air. It also is essential that standard methods of sampling and culturing be established so that the results of independent researchers are comparable.

Environmental Illness

Environmental illness is a controversial human health phenomenon similar to other ill-defined syndromes which have been described for over 100 years.[12] It has attracted attention from such diverse groups as lawyers, physicians, insurance companies, scientists, and industry. Those who suffer from environmental illness maintain that the condition is an acquired disorder resulting in an aversion to a wide variety of synthetic materials, ingested foods, and drugs, culminating in symptoms that may be multiple and wide ranging.

Because of the controversy surrounding environmental illness, BCIA strongly believes it is premature to develop governmental policy based on the vague and anecdotal information currently available. Accordingly, the initial focus of environmental illness research should be to seek clarification of the medical/physiological/psychological nature of the syndrome.

BCIA wishes to emphasize that all people deserve quality medical care including correct diagnosis and appropriate treatment. The scientific and medical communities' nascent understanding of environmental illness, however, does not allow us to adequately assess proper diagnosis or treatment. It is of paramount importance, therefore, that the issues surrounding environmental illness be resolved and that the significance of environmental exposure, if any, be established.

To address this issue, only research of the soundest scientific design should be supported, employing double-blind, placebo-controlled techniques.

Section 7—Indoor Air Contaminant Health Advisories

Public communication of information on potential health risks presents a difficult challenge to any federal program. BCIA agrees that it is important to communicate information to persons who are actually at risk from indoor air exposures that may result in adverse health effects. It is equally important, however, that the information portray the potential health risks accurately, and that it be provided in a form that can be readily understood and applied. It also is critical that the public have sufficient context in which to evaluate the information they are given.

The two indoor air contaminants typically used as examples when discussing public communication are asbestos and radon. While many other contaminants have been addressed by federal information programs, these two have received the most attention. They also may represent opposite ends of the spectrum of public concern. Awareness of the health risks from exposure to asbestos has sometimes approached hysteria, while federal and state agencies have struggled to raise the public's concern about the potential health risks of radon. This difference results from several factors and exemplifies the complexities of communicating risks to the public.

S. 656 contains one major public communications provision involving the development of health advisories. The current language of the Senate proposal would require that, for at least 11 contaminants, EPA issue a health advisory that (1) describes the potential adverse human health effects of exposures to various concentrations, and (2) provides an analysis of the risk posed by the contaminant at the full range of concentration levels. In addition, the legislation would require the development of a national response plan that will result in the reduction of human exposures to indoor air contaminants subject to health advisories and "attainment, to the fullest extent practicable, of indoor air contaminant levels which are protective of human health."

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[12] Environmental illness is known by at least 20 synonyms, including multiple chemical sensitivity, total allergy syndrome, and twentieth-century disease.

Unlike the requirements of existing statutes listed elsewhere in the bill, this legislation does not hold EPA to the same minimum standard of scientific evidence that must be satisfied before action could be taken under current laws. The legislation provides simply that health advisories be based on "the most current available scientific and related findings or information." Under this rather loose legislative language, it is unclear what standard must be satisfied before a health advisory may be issued in an area of controversial scientific theory.

If a comparison is made between this approach and the standard that governs agency action under existing statutes, it becomes clear that this legislation would conflict with the evidentiary criteria of those statutes.

Health advisories likely will have a significant impact on the public's use of products and services, including those already regulated under specific laws. In fact, a health advisory may have the same effect as a regulatory action under Section 6 of the Toxic Substances Control Act (TSCA) or another regulatory action under another statute. Yet action under existing laws must be supported by specific scientific findings that can be tested in court when necessary. The informational intent of health advisories does not justify a lesser degree of scientific scrutiny.

BCIA also is concerned that a health advisory that describes potential health effects at "various concentrations" of a contaminant likely would convey information about risks that bears no relationship to actual exposure conditions. Such a process will cause unnecessary alarm and concern among consumers who may be exposed to little or no risk. The public may believe that they are being exposed to significant health risks when actual risks may be nonexistent. Issuance of health advisories, therefore, may not result in the dissemination of relevant information about real and significant risks. It may, instead, provide misleading information about risks that are sometimes over-estimated or nonexistent.[13]

The inclusion of specific indoor air standards or action levels will significantly increase the potential for health advisory information to be incorporated into state and local regulation. Regardless of the "advisory" nature of these materials, inclusion of an action level in a federal publication will undoubtedly be interpreted by states as a scientific finding about that level. Inclusion of such levels, regardless of their scientific basis, further lessens the integrity of the advisory and implies a greater degree of certainty in evaluating health risks than generally exists.

Finally, it is important that the legislation not abandon the valuable scientific review process already in place for health advisory documents under other programs. For example, advisory documents issued under the Safe Drinking Water Act are reviewed by EPA's Science Advisory Board. Such review should be applied to indoor air contaminant health advisories.

Section 8—National Indoor Air Quality Response Plan

While EPA may be the federal agency that has devoted the most resources to indoor air quality, other federal agencies also are engaged in indoor air activities. As a consequence, many jurisdictional issues will arise as we attempt to develop a comprehensive federal indoor air quality program. Earlier versions of indoor air legislation have tended to assign most of the authority for implementing such a program to EPA. Subsequent revisions have recognized roles for OSHA, CPSC, NIOSH, the Department of Energy, and other agencies.

Coordination of federal indoor air activities through the Council for Indoor Air Quality (CIAQ) is essential. While direct interaction among high level representatives of the CIAQ member agencies is important, BCIA believes it would be advantageous to formalize a few working committees of mid-level officials on key issues. These working committees would be chaired by a representative from the most appropriate agency. We wish to offer the following examples of committees that should be considered: research, workplace indoor air quality, and consumer education.

In developing a national response strategy, it is important that each agency be given the lead role in its area of expertise, while coordinating its activities with the other agencies. BCIA does not believe that insufficient funding is an acceptable reason for failure to assign authority to the proper agency.

As noted above, BCIA also is concerned about the proposal in S. 656 to grant authority in the national response plan to reduce exposures to indoor air contaminants to levels that are "protective of human health." While the plan would be based on the use of authority granted under existing statutes, BCIA believes that the use of the phrase "protective of human health" may effectively lower the standard of proof required under these statutes. BCIA recognizes that the Senate proposal is not intended to grant additional regulatory authority, but we are concerned that it may indirectly grant such new authority. Consequently, we would encourage the Subcommittee to add language that explicitly limits the response plan to authority granted under the existing statutes listed in the legislation.

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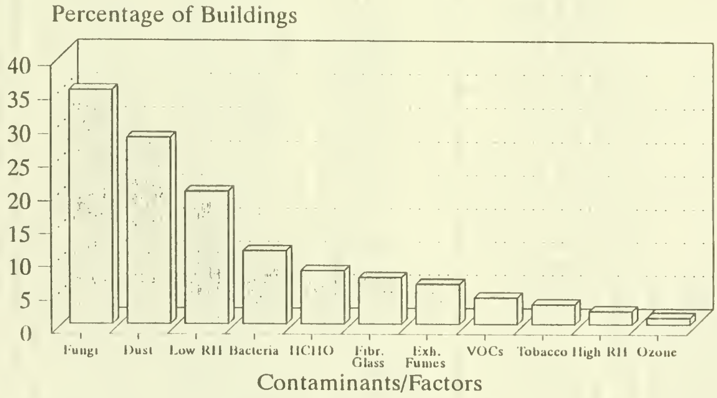
[13] BCIA has similar concerns with the disclosure provisions of Section 9 of S. 657 (the Indoor Radon Abatement Reauthorization Act of 1993) for radon levels in schools.

Conclusion

BCIA is convinced that technology-based criteria based on the total building-systems approach outlined in this testimony (including prudent, common-sense management of sources) has the best chance of improving indoor air quality in the near future. Other approaches would lead to high costs for little or no gain. A well-coordinated federal program, aimed at developing uniform guidelines and conducted in cooperation with industry, academia, and state entities, is both promising and achievable.

FIGURE 2.
Incidence of Indoor Air Contaminants



695 buildings, 103 million square feet
Source: HBI, 1980-1990.

BUSINESS COUNCIL ON INDOOR AIR

June 8, 1993
The Honorable Joseph I. Lieberman
Chairman
Senate Subcommittee on Clean Air
and Nuclear Regulation
Room 505
Hart Senate Office Building
Washington, D.C. 20510

Dear Senator Lieberman:

The Business Council on Indoor Air (BCIA) again wishes to express its appreciation to the Subcommittee and its staff for the opportunity to present its views on Senate indoor air quality legislation (S. 656). We were especially honored to be the only business group represented at the May 25 Subcommittee hearing. During its five years of existence, BCIA has endeavored to represent the interests and views of as broad a range of industries as possible. At the hearing, you asked me about BCIA's membership, and I have enclosed a list of our members for your information.

As a supplement to BCIA's written and oral testimony, we would like to provide additional comments in the following areas: (1) health advisories (Section 7 of S. 656), (2) the national response plan (Section 8 of S. 656), (3) product labeling, and (4) an OSHA rulemaking. This letter is directed at questions or issues that arose during the hearing.

Health Advisories

BCIA's primary concerns with the health advisory section of the Senate legislation, as it is currently drafted, relate to the scientific standards to which these health advisories would be held and to the circumstances under which they would be developed. To avoid unnecessary public alarm and to prevent unwarranted impacts in the marketplace, all information contained in a health advisory must be subjected to rigorous scientific review.

The current information program conducted by EPA's Indoor Air Division attempts to avoid a lengthy scientific review process by focusing on practical solutions to potential indoor contaminant problems rather than on controversial health effects data. Passage of the health advisory section, as drafted, would replace EPA's successful and well received public information program with one that would rapidly become mired in scientific debate and, potentially, in litigation.

During the May 25 hearing, Dr. Thomas Godar suggested that one should not expect a significant public response to health advisories, based on the experience with radon. As outlined in our written testimony, BCIA strongly disagrees with the contention that radon can be used as a barometer for the public's response to information on indoor contaminants and that the advisories would have little impact. One need only look at our experience with asbestos to be reasonably convinced that public hysteria often can be the result of such information. Moreover, the inclusion of quantitative risk information in the advisories would virtually guarantee that more important information on proper use would receive little, if any, attention from the general public or the media.

BCIA's experience has been that state and local governments, which are invariably understaffed and often eager to press ahead with regulatory initiatives, will use any quantitative information provided by the federal government as a basis for such initiatives. This state and local activity is certain to occur, regardless of the degree of confidence in the federal government's conclusions and regardless of attempts by federal agencies to explain the uncertainties.

If the health advisories are not expected to have an impact on consumer use patterns, there seems to be little reason to produce them. If, on the other hand, the advisories are expected to have an impact in the marketplace, then there is every reason to impose a high scientific standard for their content. As I mentioned at the hearing, there is currently no minimum scientific, evidentiary standard that must be met before a health advisory may be issued. You correctly pointed out that health advisories will be subject to peer review. In the absence of a minimum standard against which a health advisory can be "peer reviewed," however, review will provide scant assurance of the scientific validity of the contents.

All of the laws under which action may be taken as part of the response plan require a minimum threshold level of concern before regulatory action can be taken. Although health advisories are not intended to be regulatory, they will undoubtedly have an impact in the marketplace that might be as great as any regulatory action. It is inappropriate, in our view, that the threshold for action may be lowered under S. 656 simply by taking action through a health advisory, rather than pursuant to the various statutes referenced in Section 8.

Response Plan

BCIA wishes to emphasize those points made by the Administration in the written testimony submitted by EPA regarding the need to recognize each agency's statutory requirements relating to IAQ issues. We are concerned that, by attempting to establish EPA as the lead agency in the development of a national response plan, the legislation would hinder other agencies' efforts to comply with their own statutory mandates. To prevent such confusion, BCIA has suggested an alternative system that would establish the most appropriate agency as the lead for each of the key elements of a national program and would coordinate these activities through the interagency Council on Indoor Air Quality (CIAQ).

BCIA also wishes to reiterate its concerns with the specification in Section 8 that levels of indoor contaminants be reduced to levels that are "protective of human health." Such language appears to establish a different, lower standard by which EPA and other agencies may use existing statutory authority to regulate indoor contaminants. This runs directly contrary to the non-regulatory intent of this section.

Product Labeling

BCIA believes that additional product labeling authority is not necessary. EPA, CPSC, and OSHA currently require product labeling under the authorities of the Toxic Substances Control Act (TSCA), the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA), the Federal Hazardous Substances Act (FHSA), and the Occupational Safety and Health Act, respectively. Moreover, we have several specific concerns with the proposed labeling requirements that have been suggested previously by certain organizations. Specifically, we question the utility of emission-rate data and the advisability of a consumer education program to emphasize the selection of products with lower emission rates.

BCIA does not believe that emission-rate data for indoor air contaminants will provide the public with information that it can use effectively to reduce exposures to contaminants of concern. More importantly, reduction in emission rates may not result in exposure reduction or safer products. For solvent containing products, exposure will depend to a large extent on how the product is used, rather than on the specific formulation. BCIA believes, therefore, that instructions for safe use are far more valuable than emission-rate values. In fact, existing labeling requirements under both FHSA and FIFRA specify that directions for proper use be included on the label.

For these reasons, BCIA also is concerned that the development of a consumer education program to persuade the public of the benefits of low-emission products will pay insufficient attention to product safety and efficacy. The vast majority of the substances to which people are exposed indoors do not pose a health threat at the low levels generally encountered. Even in cases where emission-rate data can provide some basis for comparison between competing products, such data alone do not provide a context in which to evaluate indoor exposures resulting from the product relative to use conditions and other potential indoor exposures.

In addition, BCIA is concerned that the proposed legislation suggests that a significant health threat arises from emissions. It is unclear whether the labeling would be based on emissions of the total number of contaminants (volatile organic compounds, combustion products, etc.), on the assumption that all contaminants pose a significant health threat, on a short list of specific contaminants, or on a large number of contaminants. BCIA has concerns about the effectiveness of all of these options.

Combining the emission rates of all contaminants into one value does not distinguish among the different potential health effects of the various contaminants. Moreover, a total contaminant approach would tie the hands of a product formulator in evaluating alternative substances. Specifying a long list of substances subject to emission-rate labeling requirements similarly does not provide any basis for relative comparisons, and would dilute the effectiveness of the labeling. Alternatively, specifying a short fist of contaminants would imply that products not emitting these few contaminants are "safe." It would be counterproductive to create a program that would lead to replacement of certain volatile compounds with less volatile but less well studied, and potentially more toxic, substances.

OSHA Rulemaking

Indoor air may be one of the few issues in which labor, consumer, and health groups, as well as a large segment of the business community, agree on the fundamental basis for a national program: a workplace indoor air quality (IAQ) regulation. BCIA has urged 0511A to develop a general IAQ standard.

The Occupational Safety and Health Act of 1970 requires 0511A to set mandatory safety and health standards that require practices reasonably necessary or appropriate to provide safe or healthful employment or places of employment (29 U.S.C. Section 652(8)). Where inadequate ventilation causes a significant risk of material health impairment and the solution is technically and economically feasible, 0511A clearly has authority to adopt a health standard to improve ventilation. Similarly, where a specific substance emitted in the indoor workplace causes a significant risk, 0511A is authorized to adopt a health standard.

OSHA has already regulated extensively in this regard. In addition to substance-specific standards, the OSHA Hazard Communication Standard requires label warnings and other programs to alert employees to the hazards of substances they handle. Moreover, OSHA began a proceeding to evaluate IAQ problems and the adequacy of existing regulations in September 1991 and BCIA has urged OSHA to use its authority to address building-systems problems in the workplace.

The requirements of the 1970 Act do not differentiate between industrial and non-industrial workplaces. BCIA believes, therefore, that OSHA has adequate authority to promulgate a safety and health standard and"or guideline that applies the building-systems approach to solving or preventing IAQ problems in most workplaces.

We believe that most IAQ problems can be addressed as part of an OSHA rulemaking. While we are unconvinced that indoor air legislation is necessary at this time, if such legislation is to move forward it makes little sense to omit the one element that would have the greatest impact on IAQ: a directive to OSHA to issue a general indoor air rulemaking that would require proper design, operation, and maintenance of building systems.

Filtration

The question of filtration efficiency was raised at the May 25 hearing by another witness. In Table 2 (page 5) of the enclosed article ("Filtration Selection on an Engineering Basis"), HEPA filters are shown to trap 99.97% of all particles 0.3 microns or larger. When this filter is combined with zeolite to trap VOCs, we have an extraordinarily effective filtration unit.

* * * * *

I hope that these comments are useful to the Subcommittee as it considers indoor air legislation, and we look forward to discussing them with you at your earliest convenience.

Sincerely,

Paul A. Cammer, Ph.D.
President

The article referred to has been retained in Committee files.

BUSINESS COUNCIL ON INDOOR AIR

LIST OF MEMBERS

Abbott Laboratories
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Amoco Corporation
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Carrier Corporation
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Flack & Kurtz
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Health Science Associates
Honeywell
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ICI Americas
J. Josephson, Inc.
Meckler Group
NALC0 Chemical
National Particleboard Association
Owens Corning Fiberglas
Purolator Products Air Filtration
S.C. Johnson & Son
Shaw Industries
3M Company
Union Carbide Corporation
Weyerhaeuser Corporation

TESTIMONY OF MARY ELLEN R. FISE, PRODUCT SAFETY DIRECTOR, CONSUMER FEDERATION OF AMERICA

Mr. Chairman and Members of the Subcommittee, I am Mary Ellen Fise, Product Safety Director of the Consumer Federation of America (CFA).[1] I want to thank you Mr. Chairman for the opportunity to testify here today on S. 656, the "Indoor Air Quality Act of 1993" and S. 657, the "Indoor Radon Abatement Reauthorization Act of 1993." CFA appreciates your leadership and that of Senator Mitchell and Senator Lautenberg in addressing these important public health issues.

CFA has been concerned about indoor air quality for the past twelve years. We have filed petitions on formaldehyde and methylene chloride with the Consumer Product Safety Commission (CPSC). We have supported increased budgets for the Environmental Protection Agency (EPA) and CPSC for indoor air related activities. CFA also has been a strong supporter of providing consumers information about matters that affect the quality of their indoor air. In 1985, we produced a general IAQ pamphlet for the press and policy makers who were unfamiliar with indoor air issues.In 1984 we were one of the first organizations ever to produce a newsletter on indoor air quality.

Throughout this time CFA has supported federal indoor air and radon legislation. In 1985, in CFA's first testimony before Congress we noted that: "We face a public health problem which, if it had a single cause or a single set of symptoms, would be considered an epidemic of major proportions, calling forth the full resources of our public health system in a search for causes and cures." We believe that statement is as true today as it was in 1985.

The Need for Indoor Air Quality Legislation

Reviews of environmental hazards facing consumers have consistently ranked indoor air pollution as a serious risk. In February 1987, EPA's Office of Policy, Planning and Evaluation conducted a comparative assessment of environmental problems and, in its report entitled "Unfinished Business," concluded that indoor pollution ranked fourth out of 29 problems examined in terms of the cancer risk posed and was ranked as a relatively high risk in terms of non-cancer health risks.[2] Interestingly, although not surprisingly, a summary ranking of environmental problem areas by the level of public concern placed indoor air pollution in the low category of public perception of risk.

In 1989, the staff of three EPA Regions conducted their own comparative risk rankings for environmental problem areas. Two of the three regions ranked indoor air pollution as posing a high human health risk; the third region ranked it as medium/high human health risk.[3]

The EPA Science Advisory Board, in September 1990, concurred with these two previous reports.[4] The SAB found that indoor pollution is one of four risks to human health whose high risk ranking was supported more firmly by the available data than other health problems. About indoor pollution the SAB concluded:

> Due to the large population directly exposed to a number of agents, some of which are highly toxic, this problem poses relatively high human health risks.

Indoor air pollution is also very costly. EPA and others estimate that indoor air pollution costs our country tens of billions of dollars each year. Among others, these costs include human costs such as those associated with loss of life and illness, as well as business costs from losses in annual production when employees are working in environments with poor indoor air or when workers call in sick due to indoor air related problems.

S. 656: the "Indoor Air Quality Act of 1993"

CFA enthusiastically supports S. 656, the "Indoor Air Quality Act of 1993." This legislation represents a comprehensive federal approach to identifying and responding to indoor air pollutants. In addition to institutionalizing the EPA's indoor air program, including the indoor air quality clearinghouse, this legislation provides important funding authorizations for the indoor air program. With a current budget of $3.8 million and just 17 staff people, it is clear that despite the findings that indoor air is one of the most serious health risks within EPA's jurisdiction, the Indoor Air Division is currently understaffed and underfunded.

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[1] Consumer Federation of America is a national consumer advocacy organization, representing over 240 state, local and national organizations with a combined membership of more than 50 million consumers.

[2] See, "Unfinished Business: A Comparative Assessment of Environmental Problems," EPA, February 1987.

[3] See, "Comparing Risks and Setting Environmental Priorities; Overview of Three Regional Projects," EPA, 1989.

[4] See, "Reducing Risk: Setting Priorities and Strategies for Environmental Protection," EPA Science Advisory Board, A-101, September 1990.

CFA believes that the cornerstone provisions of this legislation are sections 7 and 8 on indoor air contaminant health advisories and a national indoor air quality response plan. The development of indoor air health advisories is an important step forward in protecting the public health and will provide a useful base of information for consumers and others. The national response plan will create a roadmap for both the public and private sectors in addressing indoor air pollutants. It also can serve as a checklist for Congress to assess the actions of federal agencies in meeting their Congressionally-mandated responsibilities under existing statutes and to identify areas where additional legislation may be needed. The opportunity for public comment and a review by the Council on Indoor Air Quality further strengthens the national response plan.

Section 6, Management Practices and Ventilation Standards, is another key component of this legislation. Assessing the effectiveness, feasibility and cost of various control technologies is critical to determining indoor air solutions. As a consumer organization, we are particularly concerned that the various products and services being offered to alleviate indoor air complaints are, in fact, effective. Consumers do not have the ability to evaluate these type products' efficacy and thus may be more vulnerable to misleading indoor air marketing claims. Because of this concern, we recommend that this section of this legislation explicitly include consumer products marketed to reduce or eliminate indoor air effects.

CFA is similarly pleased to see that section 8(g) requires an assessment of monitoring and mitigation services, including the reliability and accuracy of such services and a review of oversight options, such as registration, licensing, and certification of these firms. This assessment is very important in terms of consumer protection since consumers are technically unable to determine if they have an indoor air problem and/or whether it has been mitigated properly.

Another important provision of this bill is the assessment of the adequacy of current building ventilation standards and the preparation of recommendations regarding the establishment and adoption of adequate ventilation standards (required in Section 6). CFA believes that such a study should also include an evaluation of enforcement authority and enforcement mechanisms to assure compliance with adopted standards. For example, California has enacted a Minimum Building Ventilation Standard [5] that applies to workplaces. However its "enforcement is largely dependent on worker complaints and inspections by Cal-OSHA enforcement staff." [6] Hence, "in buildings where the number of public users greatly exceeds the number of workers or where the public is in an area not frequented by employees of the building (such as a theater or auditorium), poor air quality conditions due to inadequate ventilation could realistically continue for some time without a worker complaint or appropriate inspection." [7] Ventilation systems in residences where the occupants are unable to control the ventilation system should also be evaluated.

S. 656 also requires an assessment of the seriousness and extent of indoor air contamination in schools and child care facilities. Such a special assessment is important since children are more adversely affected by indoor air pollution than adults. [8] Because children also spend a large portion of their time at home [9], it is important that EPA consider children's exposure to indoor contaminants in the home when developing the health advisories. We believe that this legislation envisions children as a special population in its references to "populations at increased risk" [section 5 (b)(3)] and "risk to subpopulations which may be especially sensitive to exposure to the contaminant" [section 7 (b)(2)(C)].

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[5] This standard became effective in February 1987 and addresses operation, inspection and maintenance of mechanically driven HVAC systems. The HVAC system must be operated continuously during working hours, except during scheduled maintenance and emergency repairs; it must be maintained and operated to provide at least the quantity of outdoor air as was required at the time the building permit was issued; and it must be inspected annually and problems must be corrected within a reasonable time.

[6] Reducing Exposures to Indoor Air Pollutants in California: Existing Authorities and Recommended Actions, Final Report, State of California, Air Resources Board, December 1989, 79.

[7] Id.

[8] Children have: a higher intake of pollutants relative to their body surface area; enhanced absorption of pollutants; incompletely developed defense systems against such pollutants; unique behaviors that may increase exposure; and limited ability to control exposure on their own. Several studies have already shown increased health risks to children from certain indoor pollutants.

[9] In one study children spent an average of 86 percent of the total day indoors, with the greatest percentage of time indoors at home. See, "Children in California: Activity Patterns and Presence of Pollutant Sources," T. Phillips, P. Jenkins, E. Muhlberg, California Air Resources Board, June 1991.

CFA strongly supports the concept of an Indoor Air Quality Clearinghouse, as required by section 13, and we are pleased that EPA has already begun such a service. After being in operation just seven months, the Clearinghouse hotline is averaging over 1500 calls per month. While this is a relatively low rate for a consumer hotline we would expect that this number will greatly increase if it receives increased nationwide publicity and promotion. Having a source to call for reliable information is very important to consumers, particularly on indoor air, since there is little consumer knowledge and there is confusion about what action to take.

Finally, we urge your Subcommittee and the sponsors of the legislation to help assure that adequate funds are, in fact, appropriated if this bill becomes law. In order to meet the 18-month deadline for health advisories, for example, the Indoor Air Division will need adequate staff and funds. We also believe vigorous oversight by your Subcommittee will be in order to assure that indoor air quality becomes a priority issue at EPA and that the legislation is carried out in a timely fashion.

S. 657: the "Indoor Radon Abatement Reauthorization Act of 1993"

CFA also strongly supports enactment of S. 657, the "Indoor Radon Abatement Reauthorization Act of 1993". We believe that Congressional legislation is critical to continuing EPA's initial efforts in alerting the public about the need to test and mitigate their homes for radon. Exposure to residential radon is estimated to cause between 7,000 and 30,000 lung cancer deaths per year in this country, making it the second leading cause of lung cancer death. Just as indoor air was ranked high by EPA staff conducting comparative risk analysis of environmental problems, so too radon was ranked very high. In EPA's "Unfinished Business" report, radon ranked first out of 29 environmental problem areas in terms of cancer risk to humans. Indoor radon was ranked as posing a high human health risk by the staff of three EPA Regions that participated in a risk comparison project. [10]

While the EPA Radon Division has made great strides in creating an effective risk communication strategy for radon, it is clear that much remains to be accomplished. A study just recently completed by the Conference of Radiation Control Program Directors (CRCPD) found that although 67% of respondents are aware of radon, only 9% have tested their homes and only 1% have mitigated. In other words, about 9 million homes have been tested and 300,000 homes mitigated nationwide.

CFA believes S. 657 appropriately addresses the risk communication and management challenges still posed by the presence of indoor radon. We support the reauthorization of key components of EPA's existing radon program, including the state grants program, the technical assistance to states program, and the regional radon training centers. CFA also supports the requirements for radon school testing and requirements that new federally assisted housing or new federal buildings or schools built with federal financial assistance meet the model construction standards.

CFA is very pleased to see the inclusion of the real estate disclosure provision as part of this legislation. We believe that the transfer of residential real estate presents a good opportunity to notify consumers of the risk posed by radon and alerts them to financial incentives to test. It is clear from the recent CRCPD survey, where one-third of the tests occurred in the course of a real estate transfer, [11] that this is a time when consumers recognize the benefits of testing. Our organization believes that testing a home for radon is akin to having a home inspection to determine how long the hot water heater will last, whether the roof is in good condition, or whether the home is infested with termites.

Specifically, with respect to Section 12 of the bill, we recommend that subsection (a)(1)(B) be amended to require disclosure that the house has or has not, to the seller's knowledge, been tested for radon. We object to the wording disclose any "known" radon, because of the fear that this creates a disincentive to test prior to putting a house up for sale. This subsection as currently written could be interpreted to allow a seller to state that he/she has no knowledge of radon in the house, which in turn could be interpreted by the purchaser that the house has no (or little) radon. If the seller had to check one of two boxes:

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[10] See footnotes 2 and 3.

[11] In states with high radon levels this percentage was often higher. In New Jersey, for example, 47% of the radon testing occurred during real estate transfers.

—this house has not been tested for radon OR
—this house was tested for radon on (date) and the radon level was (state radon level)

there possibly may be more of an incentive to have the house tested prior to putting the house on the market. The law in New Jersey currently requires the seller of any building that has been tested for radon to provide the buyer the results of any radon test. There are some who believe this has created a disincentive ("if I don't know, I don't have to disclose") for testing in New Jersey. While the disclosure provision of S.657 is not exactly the same as New Jersey's, we recommend that the provision be amended so that it does not inadvertently create any disincentives to test.

CFA is also concerned about the civil liability provision in section 12. It provides that:

> "any person who knowingly violates any provision of this section shall be jointly and severally liable to a mortgage applicant, purchaser, or lessee in an amount equal to 3 times the amount of damages incurred by the individual."

It is unclear how such damages would be assessed. If the individual has already moved into the home, which later proves to have a radon level that is high or actionable, would damages include both the cost of any needed mitigation plus the damage from the health risk from living in a home with an elevated radon level? The provision only allows for damages incurred by the individual; if such damages include those from living in a house with an elevated radon level, damage to other family members should be included. This provision needs to be clarified as to the type of damages intended to be covered, as well as how such damages will be calculated.

While CFA strongly supports the inclusion of a remedy for non-disclosure, we believe this particular damages provision could create an incentive to void the contract, if knowledge of the non-disclosure occurs before settlement or move-in. We can envision a scenario where the seller agrees to let the buyer out of the contract rather than pay treble damages. Since this might be a consequence of the proposed damages provision, we recommend that it be included as an option; in other words, the aggrieved party could choose to collect treble damages or be relieved of his/her obligations under the contract.

CFA also strongly supports the mandatory proficiency requirements of section 13 of the bill. Because you can not see or smell radon, it is an environmental culprit that is capable of manipulation and deception by those who would like to make a quick profit. EPA is aware of businesses currently working outside of the voluntary proficiency program and has no way of knowing whether they are proficient in performing the services being offered. In addition to serving as a basic consumer protection provision, section 13 will help increase consumer confidence that radon is a problem that can be addressed and that the products and services they purchase are reliable.

CFA is concerned, however, that there will not be sufficient funds to carry out the mandatory proficiency program. The funds collected through the user fees, established through section 305(e) of the current law, [12] are likely to be reduced significantly under this bill because of the reduction of fees allowed for small businesses. [13] It is our understanding that after applying this definition, virtually every company in the radon industry would be eligible for a reduction of charges. We agree with the intent of this small business definition provision—to keep the fees reasonable in order to prevent radon companies from being put out of business, and therefore increase or maintain the existing number of companies able to serve consumers. However, an interpretation that the proficiency program must be funded solely by user fees, coupled with a reduction in fees collected, would make it impossible to operate this program. CFA believes that this legislation should make it clear that all the costs of the proficiency program do not have to be covered by user fees.

In conclusion, CFA commends the Subcommittee for addressing these important health concerns. We urge your swift consideration and mark-up of the indoor air quality and radon bills and we look forward to working with you to obtain passage of this legislation. Thank you again for the opportunity to appear here today.

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[12] See 15 U.S.C. 2665. S. 657 would redesignate this as section 306 under TSCA.

[13] A "small business" is defined in section 7 (b)(2)(B)(i) of the bill as a corporation, partnership, or unincorporated business that has 150 or fewer employees and annual gross revenues not exceeding $40 million.

Fran Du Melle
Deputy Managing Director

Washington Office
1726 M Street, N.W.
Suite 902
Washington, DC
20036-4502
(202) 785-3355
FAX (202) 452-1805

National Headquarters:
1740 Broadway
New York, N.Y.
10019-4374

John R. Garrison
Managing Director

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Founded in 1904, the American Lung Association includes affiliated associations throughout the U.S., and a medical section, the American Thoracic Society.

August 9, 1993

The Honorable Joseph I. Lieberman
Chairman, Subcommittee on Clean Air and
Nuclear Regulation
456 Dirksen Senate Office Building
Washington, D.C. 20510

Dear Mr. Chairman,

During the August 3 hearing on Title I of the Clean Air Act and related nonattainment issues the American Lung Association agreed to provide for the record comments on the process for development of National Ambient Air Quality Standards. The American Lung Association believes that there are a number of opportunities to improve the process as currently implemented.

ALA has long supported the concept that the NAAQS be based on an assessment of the most recent peer-reviewed health effects and exposure data. As we have noted most recently in our comments to the Agency on the August 1992 ozone NAAQS proposal, Congress clearly limited the issues that EPA was to consider in setting the NAAQS to those issues directly related to the effects of the criteria pollutants on human health and public welfare. Thus, issues related to economic impact and attainment feasibility are expressly excluded from consideration in this process. While we appreciate the executive order requirements that EPA must work under with respect to regulatory impact analysis, we believe that the Agency has, in the past devoted an inordinate amount of resources to examining the economic impact of the implications of NAAQS revisions at the expense of undertaking the necessary reviews of the health and welfare science.

EPA's past inability to meet the requirement of Section 109 of the Clean Air Act with respect to reviewing the adequacy of the NAAQS within five year intervals beginning in 1980 is, we believe, related to several factors that the Agency needs to consider as it reviews this process. These factors can be summarized as follows: 1) reiterate reviews of previously reviewed scientific information; 2) inclusion of extensive information on scientific issues that are not essential to the determination of whether the standard is sufficiently protective of public health and welfare; 3) an inability to "close the door" on evaluating new scientific information; 4) a drastic reduction over the past decade in the Agency's staffing and resource priority and commitment to the NAAQS review efforts; 5) inefficiencies in the timing and staff coordination for development of the Criteria Documents and Staff Papers; and 6) the amount of time required for Clean Air Scientific Advisory Committee review and "sign-off" of the draft Criteria Documents (CDs) and Staff Papers (SPs) given the current magnitude of those documents. I will go into further detail on each of these issues.

EPA currently includes information on previously reviewed scientific information in each subsequent iteration of the Criteria Documents. This exhaustive review approach, while necessary for the initial development of the NAAQS, is not necessary for the reviews required to determine whether the standards require revision. A significant amount of the staff time involved in writing the Criteria Documents and Staff Papers can be reduced by simply referring the reader to the previous CDs and SPs for information contained in previous NAAQS reviews. Eliminating this material would also reduce the amount of time necessary for review by CASAC as well as a reduction in the amount of time necessary for EPA to respond to comments received during the public comment period. It is instructive to note that such an "update" approach was successfully implemented for the first review of the carbon monoxide standard, with the process from initiation of criteria document revision in January 1978 to a final regulatory package completed for the Administrator in November 1980 accomplished in less than three years. Naturally, pollutants that have not been previously identified as criteria pollutants, and for which Criteria Documents and Staff Papers therefore have not been prepared, will require a more exhaustive CD and SP. In addition, ALA supports the inclusion in CDs and SPs of new information generated from the reanalysis of existing studies previously discussed in earlier CDs or SPs (such as with the meta-analysis technique recently employed in the oxides of nitrogen CD) when appropriate.

Criteria Documents and Staff Papers should be focused on the scientific information that is most directly relevant to determining whether the current NAAQS is sufficiently protective of public health and welfare. Extensive chapters on atmospheric chemistry, sources, transport and transformation and sampling techniques and data, while certainly of scientific interest, are for many of the pollutants of concern only tangentially related to the above determination. In addition, the studies included for discussion in these documents should be limited to those studies that have significant implications for the NAAQS adequacy determination. There is a large body of scientific data, that while important to the field, is not directly relevant to a decision on the adequacy of the NAAQS. As with the above recommendation regarding redundant information, eliminating or substantial reducing the amount of information on these topics from the CDs and SPs would dramatically reduce the staff time necessary for production of these documents, the time required for CASAC review, and the staff time necessary to respond to comments received from the public.

It is essential to meeting the Clean Air Act deadlines that EPA pick and stick to a target date after which it will no longer consider new scientific information. This recommendation is not inconsistent with our recommendation that the NAAQS be based on the most current scientific information. Were EPA to begin meeting the CAA requirement to complete its review of the NAAQS at no more than five year intervals, new data that missed a previous review would be considered in a timely fashion in the next review cycle. This would eliminate the current problem of lengthy development of CDs and SPs that ultimately require updating prior to EPA's completion of the NAAQS review cycle.

In most previous NAAQS reviews, work on the Staff Paper is not initiated until the draft Criteria Document is nearly completed. The sequential nature of this process, which contributes to the extraordinary time currently required for NAAQS review, is not necessary if the staff working on both the CD and SP are fully coordinated as a work team. While it is our understanding that there has been some initial movement at organizing EPA staff in this direction, we would recommend that work responsibilities of the staff charged with the task of producing these documents be fully integrated so that these documents can be produced on a parallel process. This approach could appreciably reduce the current NAAQS review time requirements.

ALA also believes that another significant factor in the delays incurred by the Agency during NAAQS reviews conducted over the last decade relates to the decrease in staff and resources committed to this effort. Given the magnitude of the work involved in even a streamlined NAAQS review process, the numerous existing NAAQS (eg. ozone, sulfur dioxide, particulates, nitrogen dioxide) that will require review in the next several years, and the need to evaluate whether new NAAQS are necessary for pollutants such as acid aerosols and fine particulates, EPA should examine whether current staff and resource allocations are sufficient to complete these tasks in a timely manner.

In conclusion, ALA wishes to acknowledge the respect we at ALA have for the professionalism, dedication and expertise of the Office of Air Quality Planning and Standards and Office of Research and Development staff who are involved in the NAAQS research and review efforts. The Agency is fortunate to employ some of the world's leading scientists and professionals on air pollution health effects and risks. The comments and recommendations above are not intended as criticism of the performance of these staff; rather it is intended to refine the methodology by which these talented professionals pursue their mission.

Please feel free to contact me if you would like additional information or clarification of any points.

Sincerely,

Fran Du Melle

Fran Du Melle
Deputy Managing Director

Statement of Richard M. Russell
Executive Director
Alliance for Radon Reduction
on
S. 657
A bill to reauthorize the Indoor Radon Abatement Act
before
the Subcommittee on Clean Air and Nuclear Regulation
Committee on Environment and Public Works
United States Senate

May 25, 1993

As the Executive Director of the Alliance for Radon Reduction (ARR), I would like to thank the Chairman and members of the Subcommittee on Clean Air and Nuclear Regulation of the Committee on Environment and Public Works for allowing the Alliance to submit testimony on S. 657, a bill to reauthorize the Indoor Radon Abatement Act.

ARR is an alliance of water agencies and municipalities with members from fourteen states. It was established in 1992 to work with the Administration and Congress to develop a comprehensive and cost-effective strategy to reduce the public's exposure to radon.

The Alliance believes the Environmental Protection Agency (EPA), working with Congress, should develop a holistic strategy to reduce public exposure to radon in regions with high radon levels. Since for most Americans indoor air is the primary source of radon exposure, the testing and mitigating of residential dwellings lies at the heart of reducing the public's exposure to radon.

Currently, EPA is directing most of its efforts toward mitigating the one percent of in-home radon exposure derived from drinking water. ARR believes the EPA should direct its emphasis toward addressing homes with high levels of radon rather than imposing a stringent radon in drinking water standard.

Alliance for Radon Reduction
P.O. Box 77165
Washington, D.C. 20013
202.434.4760 FAX 202.434.4763

Protecting public health through effective radon reduction

As outlined in S. 657, both testing and mitigation measures in existing homes would be conducted on a voluntary basis. Before homeowners will expend the time, money and effort necessary to test and, if warranted, mitigate radon in the home, they will have to first fully understand the risks associated with exposure to high levels of radon.

The success of any radon exposure reduction effort will therefore be based largely on the success of education efforts. To date, EPA's efforts to promote home testing and mitigation have met with only limited success. According to a December 1992 General Accounting Office (GAO) study, only eight to nine percent of the homes in the U.S. have been tested for radon. Clearly a more effective education program is needed.

S. 657 creates such an education program. Through technical assistance to states, radon disclosure requirements for property transfers, a national radon education campaign, medical community outreach efforts and a radon mitigation demonstration project, S. 657 sets out a broad based approach to reducing public exposure to elevated radon levels through education. The Alliance supports these education programs and believes that the same kind of creative initiatives should be applied to the issue of radon in drinking water.

Currently, EPA is in the process of finalizing its Maximum Contaminant Level (MCL) for radon. In July of 1991, the EPA published its proposed rule for radon. The regulation, if adopted, would require water providers with 15 service connections, or serving 25 people, to treat their water if the concentration of radon exceeds 300 pCi/l.

EPA has established an Action Level for radon in indoor air of 4 pCi/l. An Action Level is the level at which homeowners are encouraged to remediate their homes to reduce indoor air concentrations of radon. A radon level of 10,000 pCi/l in drinking water will increase the concentration of radon in indoor air by 1 pCi/l. Drinking water with a radon level of 1,000 pCi/l would therefore increase radon in indoor air by 0.1 pCi/l (accounting for 2.5 percent of the Action Level). At a level of 300 pCi/l in water, indoor air concentrations would increase by 0.03 pCi/l (less than one percent of the Action Level).

The Alliance believes that setting a stringent radon in drinking water rule such as the EPA proposed will do little to reduce the public exposure to radon while costing the nation billions of dollars to comply. According to the EPA's own Scientific Advisory Board (SAB), a 300 pCi/l standard would only address one percent of human radon exposure in the home. The water industry estimates that it would cost in excess of $12 billion to address this tiny fraction of the overall radon risk.

The Association of California Water Agencies (ACWA), one of ARR's founding members, found that in California alone compliance cost associated with the 300 pCi/l standard would exceed $3.7 billion. This sum is sufficient to remediate all the homes in California with radon levels above EPA's Action Level.

Even using EPA's own cost estimates, mitigating radon in drinking water is at least ten times more expensive than mitigating radon in indoor air. Using industry or EPA figures, it is clear that mandating a 300 pCi/l standard for radon in drinking water makes little sense. As an alternative, the Alliance supports addressing radon in drinking water as part of an overall radon exposure reduction strategy. ARR supports using the same kind of creative thinking seen in the education provisions of S. 657 to develop a cost-effective means of addressing radon risks in areas where drinking water is a contributing factor.

The Alliance believes that the Subcommittee should give serious consideration to consolidating all of the government's efforts to address radon, including those directed toward radon in drinking water, when it reauthorizes the Indoor Radon Abatement Act. Bringing the radon in drinking water issue under S. 657 will allow for the development of appropriate cost-effective programs to reduce the public's exposure to radon. One possible strategy for addressing radon in drinking water is to pair a less restrictive radon in drinking water standard to a radon exposure reduction education project sponsored by water agencies. Under such an innovative program, EPA could adopt an MCL of 1,000 to 2,000 pCi/l and water agencies could be required to undertake an education program to inform their customers of the risks associated with radon, including proposed steps the public could take to reduce their exposure.

S. 657 already contemplates the use of utility bills as conduits for information on radon. In section 23 (b) (1) (F), S. 657 requires the Administrator of the EPA to report to Congress on "the effectiveness of alternative strategies to promote radon testing" including "distributing radon information with utility bills." The Alliance believes that public water agencies, if not overburdened with costly and unreasonable regulation, can be an important part of such alternative education strategies.

The Alliance is committed to working with Congress and the EPA to formulate a reasoned radon in drinking water standard that will protect public health in a cost-effective manner. We believe that the 300 pCi/l MCL is the least cost-effective strategy for preventing radon related cancer cases. Using the education provisions of S. 657 as a guide, we believe that a creative and effective solution to the radon in drinking water problem can be found that will not only save billions of dollars but also lives.

Again, I would like to thank the Chairman and members of the Subcommittee on Clean Air and Nuclear Regulation for affording me the opportunity to present the Alliance for Radon Reduction's views on S. 657. ARR's members and I remain ready to work with the Subcommittee on constructive strategies to reduce the public's exposure to radon.

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Robert B. Stobaugh
Charles Edward Wilson Professor of Business Administration
Harvard Business School

Written Testimony of:

Bion D. Howard
Senior Program Manager Building Science
Alliance to Save Energy
1725 K. St N.W. Suite 509
Washington, DC 20006

To

The Senate Sub-committee on
Clean Air and Nuclear Regulation

June 7, 1993

1725 K Street, N.W. · Suite 509 · Washington, D.C. 20006-1401 · 202/857-0666 · Fax: 202/331-9588

My name is Bion D. Howard, and I am a Senior Program Manager with the Alliance to Save Energy, a coalition of government, business, consumer, environmental and labor leaders dedicated to promoting policies and programs to increase energy efficiency. I appreciate this opportunity to provide brief written testimony to the sub-committee on the issue of testing and mitigation of radon gas in lower-income U.S. housing. My work and experience over the last 15 years has been on improving the energy and environmental performance of buildings, principally housing. I would like to briefly review the issue of radon gas in low income housing, and how the low income weatherization program could be enhanced and studied to help deal with the radon gas problem.

Introduction

The right to speedy identification of radon affected housing, and the mitigation of high levels of cancer causing radon gas in their homes should not be "reserved" for only higher income homeowners. The current lack of radon testing -- whether perceived or real -- in lower income homes must be rectified. The Alliance has tried to get data on the frequency of lower income homes which have been tested for radon, and has not been successful. We are not currently aware of any radon testing programs which identify housing by income level, and so are concerned that little may be known as to the equity of current radon gas abatement programs in serving the less well-off. This is not to say states or municipalities have necessarily failed to protect this segment of society, but rather to flag an important issue to be addressed.

Why Bother Testing for Radon?

According to studies by U.S. EPA and other groups -- such as the pioneering and sometimes controversial work of Dr. Bernard Cohen in Pennsylvania -- there is really no way to know if a home has high radon gas or "progeny" concentration levels, without testing. If a home is in a radon-prone area, like those identified on the radon maps issued by EPA, can a home owner, or buyer really know if radon gas is a problem? Not with out testing.

An accurate radon testing cycle can often take 6 months to one-year to complete. If a home has several stories or thermal zones, the costs of such testing can be significant. Research data shows that there can be fluctuations of indoor radon gas and progeny concentrations that are highly variable with such things as soil moisture (related to rainfall), barometric pressure, locations of air-leakage sites in a homes' "envelope" and the speed and direction of the wind.

Radon testing begins with so-called "screening tests" usually conducted for periods of less than one week. These tests are done to identify homes with significantly elevated radon levels, so additional longer term testing can be conducted. Data shows these screening tests are not particularly accurate. However, they were not designed as "rocket science," but rather to indicate quickly and inexpensively, which homes in an area require additional longer term (and more accurate) testing. If very high readings are found on screening tests, recommendations may be made for immediate mitigation activities to begin, as a function of the elevated cancer risk.

The Challenges of Radon Prevention in Housing

The myriad variables affecting the flow of air into and out of residential structures means that radon levels will vary in homes on every time scale. However, the concern about radon rises in areas where homes are closed up during cold and/or possibly very hot times of the year. The air-sealing of homes to save energy has in some cases (but not always) led to higher indoor radon levels.

The ability of an individual home to resist, or to exacerbate, the level of indoor radon depends on the measures taken to reduce its coupling with the soil; the quality of air-sealing and the locations where air-sealing measures have been applied; how its heating and ventilation systems are installed, maintained, and operated; whether it is in a sheltered or open site relative to weather; and the way in which occupants utilize the home and its energy using systems.

However, new energy efficient homes, built specifically for good indoor air quality have been shown to resist radon buildup indoor through good sealing and sub-slab depressurization techniques shown to be effective in numerous EPA studies. These proven systems are never present in lower-income existing homes, which studies show often have significant design, structural, and maintenance problems that can potentially increase the risk of radon gas entry and build-up.

Why Should Low-income Weatherized Home be Tested?

Using the Federally supported weatherization programs to help implement radon testing has the distinct advantage of an infrastructure in place that identifies needy homes, and inspects them to determine what energy-saving measures should be installed. These site visits, and the fact that technical people who know about housing visit the homes makes this an ideal opportunity for radon test-kit deployment, recovery and analysis.

Authorization and appropriation of Federal funding to implement a program for a radon testing and results-advisory to local health and radiation authorities on each low-income home being considered for weatherization would be of tremendous value to the nation.

The perceived complexity and cost of radon testing does not lend itself well to a segment of society that may be preoccupied with other more fundamental issues of survival. If choices need to be made between paying bills, buying food, or clothing the children, the cost and perceived seriousness of a radon test will likely not compete.

The lower income person also may not have access to radon testing due to its expense, or due to simple ignorance of the radon issue and the long term health risks. EPA has worked hard to help states set up radon programs, but there is little evidence we could find that local radon awareness campaigns exist targeted toward lower income individuals. If successful radon programs do exist at the state or local levels, they should be identified, studied, and more widely promoted as models to other agencies and jurisdictions.

The previous discussion indicated many variables influence radon concentrations, and hence the associated health risk to housing occupants. The health risk of radon is a longer term issue, again not playing to the hearts and minds of persons who may have more serious short-term problems to contend with.

How Widespread is the Problem?

There are few major urban centers without significant housing problems. Secondary to just finding housing, for some needy families, are issues that include energy waste (high utility bills that may go in arrears, or result in disconnection), structural or moisture problems. In some cases, dwellings are in significant need of structural repair prior to even preliminary consideration of weatherization projects. These conditions are usually identified in the pre-weatherization site visits.

According to the Oak Ridge National Laboratory working group on improving low income weatherization, there could be up to 28 million housing units that are lower-income and in need of significant energy upgrades. Other sources have pegged the number of low-income homes at "over 20 million." This mass of "needy buildings" undoubtedly has a significant portion of radon-affected homes. EPA testing conducted during the 1980's in numerous states shows the percentages of affected homes varies widely. But even if only five percent had excessive radon levels this could represent 1- to 1.5 million low income homes.

Lower income housing also tends statistically to be occupied by larger groups of persons. So more people could be impacted by elevated radon levels per housing unit, than would be the case for a broader sample of society.

These persons also tend to be short on health-care. So if elevated radon levels in low income housing bring about greater incidence of lung cancer in a portion of the U.S. population that has minimal to non-existent health care provided to it, a significant social inequity results. So far there have been no studies we know of focused on this potentially serious problem.

Furthermore, one of the most frequently discussed environmental concerns today stems from evidence that lower income and minority groups already are forced to tolerate more that their fair share of outdoor air pollution as a result of location near polluting industrial sites, and have less political clout to do something about emissions violations.

This then could represent a "double-whammy" on the lower income U.S. population. Housing they can afford may be both more prone to radon gas, and frequently located in areas of higher outdoor ambient pollution, over which they have little control or influence due to their social status. At least dealing openly and fairly with the potential for higher impact of unmitigated radon problems in lower income populations would help address this issue.

Recommendations

The Alliance to Save Energy recommends that the following steps be taken to lessen the impact of radon gas on low and lower income persons:

1. Conduct radon gas testing in every candidate home for low-income weatherization (energy retrofitting) grants in federally supported programs.

2. Such an effort should include effective follow-up coverage so that the radon test results are effectively communicated to local health and radiation authorities when high levels are found. The home owner should also be informed on the significance of radon gas an how their health could be impacted.

3. Task the Agency Chief (Secretary) of EPA to thoroughly investigate the issue of reducing radon gas in lower income housing, in collaboration with both the U.S. Department of Energy weatherization and radon programs.

4. Programs and projects developed as a result of recommendation #3 should include research and demonstration of better means to simultaneously implement energy efficiency rehabilitation, and radon gas mitigation approaches during improved weatherization site visits in lower income housing. Development of such protocols could make radon gas mitigation in low income housing less costly and more effective.

5. Conduct a national study on whether lower income persons suffer greater health impacts of radon gas as a result of their higher exposures to sub-standard housing. This effort should be part of a broader concern that less fortunate segments of society are not unnecessarily exposed to greater levels of toxic pollutants than society as a whole.

AMERICAN
INDUSTRIAL
HYGIENE
ASSOCIATION

2700 Prosperity Avenue, Suite 250; Fairfax, VA 22031; (703) 849-8888; fax (703) 207-3561

STATEMENT FOR THE RECORD

The Indoor Air Quality Act of 1993

S. 656

U.S. SENATE
COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS
SUBCOMMITTEE ON CLEAN AIR AND NUCLEAR RADIATION

HONORABLE JOSEPH I LIEBERMAN, CHAIRMAN

June 22, 1993

Submitted by:

Harry Ettinger, CIH, PE
President
American Industrial Hygiene Association

SENATOR LIEBERMAN AND MEMBERS OF THE SENATE ENVIRONMENT AND PUBLIC WORKS SUBCOMMITTEE ON CLEAN AIR AND NUCLEAR RADIATION:

The American Industrial Hygiene Association (AIHA) appreciates the opportunity to submit this statement for the record regarding the May 25 hearing on The Indoor Air Quality Act of 1993 (S. 656).

The AIHA is the largest international association of occupational and environmental health and safety professionals. With 10,000 members practicing industrial hygiene in government, labor, industry, academia and private business, AIHA members are health and safety professionals who anticipate, recognize, evaluate and control environmental factors affecting workers, their families and their community. The issue of indoor air quality has been designated as a "top priority" of AIHA in 1993.

The AIHA supports the enactment of the Indoor Air Quality Act of 1993 (Senate Bill 656), with several recommendations on how to make the Act more responsive in addressing the concerns of indoor air quality. AIHA believes, as stated by Senator George Mitchell in his introduction of the Act on March 25, 1993, that "the evidence of the health threats and economic costs of indoor air pollution grows and grows (each year)". AIHA applauds the efforts of the Congress to address indoor air pollution and the adverse health effects experienced by workers and building occupants. For many years, AIHA members have been in the forefront in the investigation of indoor air quality complaints. As the largest professional industrial hygiene association in the world, AIHA recognizes its responsibility to ensure all workers are provided with a healthy and safe workplace.

AIHA believes the Indoor Air Quality Act will provide an opportunity for the improvement of the ongoing research efforts of the federal governmental agencies involved with this issue, namely the Environmental Protection Agency (EPA), the

Occupational Safety and Health Administration (OSHA), and the National Institute for Occupational Safety and Health (NIOSH). AIHA strongly supports the coordination of their activities through the Council on Indoor Air Quality as found in Section 12 of the Act. This coordination avoids duplication of effort and allows scientific resources to be applied efficiently to the problems of indoor air quality. The Council will also have representation from other federal agencies and the Council's Report to Congress will be available for public review and comment. However, AIHA believes the Council's activities would be enhanced by inserting language to create a public technical committee to address scientific aspects of indoor air quality. AIHA requests inclusion on this public technical committee, should it be created, and believes our participation is needed because of our expertise and experience with Indoor Air Quality issues.

AIHA is concerned about the enforcement roles of the federal agencies involved with indoor air quality. AIHA supports the continued enforcement role of OSHA in the evaluation of workplaces for health and safety hazards, including indoor air quality. AIHA also supports the National Indoor Air Quality Response Plan found in Section 8 of the Act. However, AIHA believes the Response Plan would be far more effective if the Assistant Secretary of Labor for Occupational Safety and Health is the lead federal authority for the development and implementation of the supporting actions of the Act. OSHA has the experience and expertise to play the lead role in this effort, but should do so in coordination with other appropriate federal agencies.

Section 8 (g) of the Act calls for the review of the options for oversight of indoor air monitoring and mitigation services, firms and organizations, including registration, licensing and certification. AIHA believes language should be added to the legislation directing the federal government to review and certify the training and certifying organizations so that there are established minimum certification criteria in this field. AIHA supports increased quality control of practitioners in the indoor air quality field. However, AIHA believes training and certification of practitioners would best be handled by each profession involved with the issue, i.e. the American Board of Industrial Hygiene for Certified Industrial Hygienists, and other organizations involved with professionals such as registered architects and professional engineers. The industrial hygiene profession certifies its professionals on the basis of education, examination and experience. The certification is directed by the American Board of Industrial Hygiene (ABIH), which certifies industrial hygienists in comprehensive and specialty aspects, which encompasses the scope of indoor air quality problems and solutions.

AIHA strongly supports Section 5 concerning Indoor Air Quality Research. The ongoing research programs at EPA and NIOSH must be adequately funded in order that they can continue to conduct an effective research program. In addition, funding should be sufficient so that the agencies can address developing indoor air quality issues as they arise. AIHA also supports the granting of funds by EPA to other public agencies and authorities to nonprofit institutions and organizations, and to other qualified persons for the purpose of indoor air quality research. This Section will also support the collection and dissemination of the research information based on sound scientific evidence. AIHA supports this effort.

AIHA recommends that work-related allergies be addressed as a research topic with Section 5 (b). This is a growing area of concern, and many of AIHA's members have encountered indoor air situations that involved the diagnosis of allergic reactions to bioaerosols, chemicals, and microorganisms. Additional research is needed into the causes of these reactions, and accurate and complete information on the research should be disseminated to the public when it becomes available.

AIHA supports Section 6 concerning the Management Practices and Ventilation Standards. AIHA supports the public review of the Technology and Management Practice
Assessment Bulletins because this will allow for peer evaluation by qualified scientists prior to the release of the Bulletins to the public.

AIHA supports the Model Building Management Practices Training provisions of Section 6 (b). However, the training program developed by NIOSH for Federal Agency Indoor Air Quality coordinators should be expanded to a training accreditation program developed in consultation with the private sector and based upon the successes and failures of all government agencies involved with training programs, such as requirements found in asbestos and lead. In this fashion, private training providers can be accredited to provide this type of training for Indoor Air Coordinators both in Federal buildings and private buildings.

AIHA supports the Ventilation Program of Section 6 (c). The program outlined coordinates the analysis of the adequacy of existing ventilation standards and guidelines to protect the public from indoor air contaminants. Section 6 (c) requires EPA to report to Congress within three years on recommendations concerning the establishment of standards and how to ensure that adequate ventilation is achieved in buildings. AIHA supports this approach because science provides the foundation. The analysis of current ventilation standards and guidelines, in the technically comprehensive approach specified in the bill, should answer many questions surrounding ventilation and indoor air and provide EPA and other agencies with a sound technical basis for ventilation policy.

AIHA opposes Section 7 dealing with the Indoor Air Contaminant Health Advisories. This opposition stems from the deadline of two hundred and forty days for the release of all indoor air contaminants that may have an adverse impact on human health. The deadline is inadequate and a longer period of time is needed to perform a proper risk assessment on each of the listed contaminants. We also believe that OSHA has more experience and expertise in this area and should be the lead agency. In addition, AIHA recommends the participation of nongovernmental occupational and environmental health professionals in the field of indoor air quality, such as Certified Industrial Hygienists, on the Advisory Panel charged with the responsibility of implementing this Section.

AIHA is concerned about Section 9 (c) regarding the Indoor Air Quality Reserve to be set aside for the design and construction of measures to reduce indoor air contaminant concentrations within new Federal buildings. The measures listed in Section 9 (c) (2) should be developed through research to be undertaken by EPA, assisted by other agencies, and the National Institute of Building Sciences (NIBS), the nonprofit, non-governmental organization authorized by Congress, to facilitate the introduction of new and existing products and technology into the building process.

AIHA opposes Section 9 (f) (1) regarding the restriction that an Indoor Air Quality Coordinator not serve more than one Federal building. This has potential implications for private buildings if it is adopted for all Federal buildings as the state of the art. AIHA recommends that no arbitrary restriction should be placed upon the number of buildings an Indoor Air Quality Coordinator may serve. AIHA makes this recommendation in an effort to provide flexibility to the government to more efficiently use resources (professionals) experienced in indoor air quality. Federal Agencies should be required to designate and train Indoor Air Quality Coordinators for each building they occupy, but no arbitrary limits on the numbers or scope of the Coordinators should be imposed in the legislation.

AIHA and its members are committed to working with Congress on the improvement and enactment of S. 656. AIHA believes the Indoor Air Quality Act of 1993 is important legislation, and we as professionals in the field of occupational health and safety will work to ensure the protection of the health of the American workforce. AIHA and its members are interested in participating in discussions with Congress on S. 656 regarding our concerns and our recommendations for improvement.

Senator Lieberman, the AIHA thanks you for the opportunity to comment on this important piece of legislation and is prepared to assist you in your deliberations.

Thank you.

BOWSER MORNER
COMMITTED TO EXCELLENCE
SINCE 1911

4518 Taylorsville Road
P.O. Box 51
Dayton, OH 45401-0051
513-236-8805
513-233-2016 FAX

May 26, 1993

Mr. Paul Chimes
United States Senate
Washington, DC 20510-6175

Dear Mr. Chimes:

Attached are our comments to Senate Bill 657 (the Indoor Radon Abatement Reauthorization Act of 1993). In general, we support passage of this bill; however, we feel that there are some deficiencies in it, and the original Indoor Radon Abatement Act of 1988, which need to be addressed in the final version of the reauthorization bill.

Bowser-Morner, Inc. has made a significant investment in developing a state-of-the-art, commercial radon calibration laboratory that features a calibration chamber similar to those in use at the EPA's radon laboratories. Such a commercial laboratory is needed to provide quality assurance services to the radon industry, so that radon testing companies can fulfill the quality assurance requirements specified in Indoor Radon and Radon Decay Product Measurement Device Protocols (EPA 402-R-92-004).

Building and operating a calibration laboratory with the proper equipment and personnel is an expensive endeavor. After a year of operation we are still far short of breaking even with operating expenses. Therefore, any segment of the radon industry that could be using our services is very important to us. As explained in greater detail in our attached comments, we have on several occasions lost work from potential clients to the EPA laboratories. EPA's response to our complaints about this competition has been that the EPA is authorized by the Indoor Radon Abatement Act of 1988 to provide these services, even though they are in direct competition with private companies. It has been my personal experience in the past, as an employee of the Federal government and one of its prime contractors, that the Federal government strives not to be in direct competition with private companies. Our attached comments are aimed at changing the radon legislation to put an end to the EPA's competition with private radon calibration laboratories.

Thank you for your consideration of our comments. If you need any further information, please call me at (513)236-8805, ext. 248.

Very truly yours,

Phillip H. Jenkins

Phillip H. Jenkins, PhD, CHP
Director, Radiological Services Division

BOWSER-MORNER, INC.
COMMENTS REGARDING SENATE BILL 657
INDOOR RADON ABATEMENT REAUTHORIZATION ACT OF 1993

1. Issues Related to the Indoor Radon Abatement Act of 1988

The Indoor Radon Abatement Act of 1988, at 15 USC 2667.(a)(5)(B) and 15 USC 2669.(d)(2), authorizes the USEPA to make its laboratories available to States or Federal agencies for the evaluation of radon measuring instruments. These same sections of the law also authorize the EPA to recommend other laboratories (presumably, commercial laboratories) for these activities. Further, at 15 USC 2666.(c)(5) it is stated that grant assistance to States may be used for "purchase and maintenance of analytical equipment connected to radon measurements and analysis, including costs of calibration of such equipment."

It has been the EPA's practice to use its laboratories to provide calibration and quality assurance assistance to State and local health agencies, as well as universities, at no cost. Also, such assistance has been provided to Federal agencies through Interagency Agreements. Until recently, such use of EPA's laboratories was necessary because no viable commercial laboratory existed that could provide these services. This is no longer true. Bowser-Morner, Inc. now operates an independent, commercial laboratory that has features similar to the EPA laboratories and has properly trained personnel to provide calibration and quality assurance services related to radon measurement equipment. In addition, there are at least two other commercial radon laboratories in the U.S. that offer quality assurance services to the radon industry.

Although the law authorizes the EPA to recommend another laboratory for quality assurance services, and even provides for grant money to be used to pay a laboratory for calibration of radon equipment, there is nothing in the current law which requires the EPA to develop the criteria by which it might recommend another laboratory. Without such criteria, there is no mechanism by which the EPA can recommend another laboratory. Therefore, this option may as well not exist in the law, because it is impossible to exercise.

On several occasions, potential clients that were State or local health agencies, or universities, decided at the last moment not to use our services because they discovered that they could obtain the desired services from the USEPA at no cost. Also, we have found in submitting bids for services to Federal agencies that we were directly competing with the USEPA laboratories. It does not appear to be the intent of the Indoor Radon Abatement Act of 1988 that commercial laboratories would be precluded from providing services to State and local health departments, universities, or Federal agencies, but in essence that is what has happened.

BOWSER-MORNER, INC.
COMMENTS REGARDING SENATE BILL 657
INDOOR RADON ABATEMENT REAUTHORIZATION ACT OF 1993
(continued)

We request that language be added to Senate Bill 657 that requires the Administrator of the EPA to develop the criteria and mechanism by which the EPA may recommend a commercial laboratory for calibrations and quality assurance services related to radon measurement equipment.

2. Issues Related Directly to Senate Bill 657

A similar situation exists within Senate Bill 657. In its present form, this bill makes the proficiency testing program mandatory (Sec. 7 (b) and Sec. 13.) and also authorizes the Administrator "to enter into any agreement or other arrangement with any State for the purpose of delegating the radon proficiency program of the Environmental Protection Agency, including enforcement provisions, or any other part of the program, to the State, if the State program is consistent with the Federal program."

At least one State currently has its own proficiency testing program, which utilizes commercial radon calibration laboratories. In Sec. 13., Senate Bill 657 authorizes EPA to approve State proficiency testing programs, but it does not require the EPA to develop a mechanism by which such approval may actually be achieved. Without such mechanism, the EPA will be unable to approve State proficiency testing programs. Therefore, the only EPA approved program will be EPA's own program, using its own laboratories. Commercial laboratories will be effectively precluded from participation.

We request that language be added to Senate Bill 657 to require the Administrator to develop the mechanism whereby State proficiency testing programs, utilizing commercial radon calibration laboratories, may be approved.

COMMENTS FOR THE RECORD
SUBMITTED BY THE
BUILDING OWNERS AND MANAGERS ASSOCIATION (BOMA) INTERNATIONAL

HEARING ON THE INDOOR AIR QUALITY ACT OF 1993 (S. 656)

MAY 25, 1993

SUBCOMMITTEE ON CLEAN AIR AND NUCLEAR REGULATION

SENATE ENVIRONMENT AND PUBLIC WORKS COMMITTEE

Building Owners and Managers Association International
1201 New York Avenue, NW, Suite 300
Washington, DC 20005
(202) 408-2684

The Building Owners and Managers Association (BOMA) International appreciates the opportunity to comment on S. 656, the Indoor Air Quality Act of 1993. BOMA's membership is responsible for owning or managing more than 6 billion square feet of commercial office space across the country, and maintaining top quality indoor air is one of our primary concerns.

First and foremost, we recognize the need for sound research into this issue and the dissemination of practical guidance -- both areas addressed by S. 656. BOMA is pleased to be sponsoring a nationwide IAQ seminar series, through a cooperative agreement with the EPA, that has provided "state of the art" guidance to building owners and managers in over 50 cities. We firmly believe that these programs will result in improved management practice in buildings across the country. We also believe that the guidance must be given a chance to work before any federal regulations are considered.

Good indoor air is a marketplace demand. When tenants agree to lease space in a building, they demand various goods and services including security, clean surroundings, and a productive work environment. Indoor air quality is one of those demands. No tenant tolerates poor indoor air, and few tenants are shy about voicing their concerns directly to building management. It is in the best interest of the building management to insure good indoor air because, otherwise, the tenant will look for space elsewhere.

The EPA/NIOSH Building Air Quality manual advocates a three-pronged approach in preventing IAQ problems: filtration, ventilation, and source reduction. Where inadequate filtration is the cause of complaints, there may be an adequate flow of air but too much dust or dirt in that air. The heating, ventilating, and air conditioning (HVAC) system may itself be the cause of contamination, in which case increasing the ventilation will exacerbate, rather than diminish, the problem. Where materials or activities inside the building are the root cause of complaints (e.g., off-gassing from carpets or furnishings, smoking, cooking, cleaning fluids, pesticides or paint), the challenge for building management is to remove or remedy that particular source, rather than "blowing the problem around" through increased ventilation. For example, an air intake vent may be poorly situated and drawing in polluted air from the street or garage. Relocating that vent -- rather than increasing outside air flow -- would address the problem. Generally, the challenge for building management is to identify the contaminant source and either remove it, alter it, or provide exhaust fans for it.

One of the most obvious and widespread sources of indoor air complaints is tobacco smoke. In view of the EPA's recent classification of environmental tobacco smoke as a Class A carcinogen, BOMA has resolved to support a federal ban on smoking in the workplace, which would remove a significant indoor air contaminant. Currently, workplace smoking policies can be implemented to prohibit smoking or limit it to designated areas.

Thanks to air testing, extensive filtration, and good preventive maintenance, tenants are often provided with air indoors that is substantially cleaner than the air outdoors. Buildings can be seen to function as the "lungs of the city" -- since outside air often brings with it pollen, pollution, and humidity. It follows that, as more air is ventilated indoors, more energy will be needed to heat that air in the wintertime and cool it in the summer. This becomes an issue for building management as efforts are made to conserve on energy costs.

It is important to note that most of the highly publicized indoor air problems (such as plagued the Social Security Administration building in Richmond, California) have developed in government buildings or in schools. In contrast, the tenant's rent check is a critical incentive for private sector owners and managers to provide good indoor air. If the air quality is not satisfactory, tenants can and do move elsewhere.

Of all the steps taken to address an indoor air problem, few are as important as the concerned and professional attention given the tenant. Regardless of the potential cause or the final outcome, to the tenant the problem is real and demands immediate attention. Building management strives to handle complaints in a timely and professional manner, while educating tenants that the responsibility for addressing indoor air quality is shared by all.

BOMA hopes that these comments will be useful to the Subcommittee in considering the merits of the Indoor Air Quality Act. If we can answer any questions or provide assistance, please contact James Dinegar, Vice President of Government and Industry Affairs, at (202) 408-2684.

STATEMENT ON S.656
SUBMITTED TO THE
SUBCOMMITTEE ON CLEAN AIR AND NUCLEAR REGULATION OF THE SENATE ENVIRONMENT AND PUBLIC WORKS COMMITTEE
JUNE 7, 1993

Chemical Specialties Manufacturers Association
1913 Eye Street, N.W.
Washington, D.C. 20006
(202) 872-8110

STATEMENT ON S.656
SUBMITTED TO THE
SUBCOMMITTEE ON CLEAN AIR AND NUCLEAR REGULATION OF THE SENATE ENVIRONMENT AND PUBLIC WORKS COMMITTEE
JUNE 7, 1993

The membership of the Chemical Specialties Manufacturers Association (CSMA) consists of over 400 companies primarily involved in the formulation, manufacture and marketing of household and institutional care products, including: detergents and cleaning compounds; disinfectants and sanitizers; waxes, polishes and floor maintenance products; home, lawn and garden pesticides; and automotive specialty products. Our members spend considerable resources each year on research and testing, and the industry is constantly striving to ensure not only the effectiveness but also the safety of its products. For the past several years CSMA has deemed indoor air quality (IAQ) an issue of critical importance.

CSMA could generally support the objectives of S.656, the Indoor Air Quality Act of 1993, specifically: additional research into the causes and effects of indoor air pollution, improvements in building systems, and better public understanding of indoor air health hazards. In 1990 CSMA supported H.R. 5155 as reported by the House Science, Space and Technology Committee. While we could not endorse certain provisions, overall we feel the legislation would have effectively and responsibly addressed those three important goals.

REVIEW OF ISSUES

We wish to review briefly some specific indoor air quality issues of interest to the chemical specialty products industry.

First, we believe indoor air legislation at this time should focus on research rather than regulations or standards for contaminants. The current legislation funds research into exposure assessments, health effects, and control techniques, as well as building systems. Results from this research should be collected and analyzed before Congress can properly consider any regulatory strategy. We also are concerned that the definition of "indoor air contaminant" as it is applied in certain non-research portions of the legislation not be too broad; if so, it will frustrate EPA's ability to focus on those few contaminants likely to pose a significant threat to human health when found in indoor air.

Second, we strongly oppose emission labeling for indoor air contaminants in various products, including "products containing solvents" and "pesticides," as was suggested in House legislation last session. The decision by Rep. Kennedy (D-MA) to drop the labeling provision from his revised legislation (H.R. 1930) is recognition of the fact that, to the extent that any of these products present a risk of harm to consumers, warnings of potential risks are already required by federal law. Should a need for further labeling arise, these statutes provide ample authority for the additional language.

For example, the Federal Hazardous Substances Act (FHSA) already covers labeling of most household and institutional care products. Under FHSA the Consumer Product Safety Commission (CPSC) requires manufacturers to provide appropriate warning labeling for any product containing a substance which may cause personal injury or illness through absorption, ingestion, or inhalation. The CPSC has produced hazardous substances labeling guides, primarily for acute hazards, for more than a decade. Furthermore, the CPSC has recently codified guidelines used for many years in labeling for chronic hazards.

In order for our member companies to label their products appropriately under FHSA, they begin by reviewing the potential routes of exposure that may occur from the use, as well as any foreseeable misuse, of each product. The formula is carefully reviewed -- including inhalation evaluations -- to determine if there are substances which present any hazards indigenous to their use. Additional testing performed on household care products includes performance -- to ensure the product will function as promised -- and stability -- to ensure the product will not change over time.

These same points apply to pesticides. Any product making a pesticidal claim must be registered under the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA), and EPA must approve the label for that product. Unfortunately, there are several organizations (including government agencies) promoting "home-brew" mixtures, allegedly beneficial to the environment generally and indoor air specifically, which make pesticidal claims without being registered with EPA, in violation of federal law. They also often make unsubstantiated claims such as "safe" or "non-toxic," a violation of federal rules.

As part of this process, each registration is subject to a toxicological review by EPA. This review includes inhalation as well as other hazards, and EPA requires an inhalation warning on the label if warranted. Again, therefore, the inclusion of emission rate information on the label is not necessary or particularly helpful to consumers.

It should also be noted it is difficult if not impossible to compute a meaningful emission rate for most chemical specialty products. Unlike building materials, such as carpet or wallboard, such products usually do not emit at a constant rate. Rather, emissions vary by task and consumer use. It is a misconception, therefore, to think that meaningful emission rates could be developed for cleaners, disinfectants, polishes and the like, for which use patterns vary so widely.

RESPONSE TO AMERICAN LUNG ASSOCIATION TESTIMONY

We feel it is imperative to clarify and correct, for the record, several points raised by the American Lung Association (ALA), represented by Dr. Thomas Godar, in their written and oral testimony.

First, on the second page of their unnumbered testimony, the ALA impliedly characterizes the impact of "household cleaning fumes" as equivalent to exposure to three known human carcinogens: asbestos, radon, and environmental tobacco smoke. This unfortunate instance of hyperbole is aggravated in the next paragraph by the overstatement that "individual control of indoor air pollution is very limited. . ." As described above, because of the requirements of FHSA and FIFRA, consumers who read and follow household-product label directions can be assured of the maximum degree of safety and efficacy. We hope the ALA will join us in focusing on this important message.

As discussed in further detail below, CSMA strongly disagrees with ALA's endorsement of the listing provision in section 7 of the Act, noted on the fifth page of their testimony. The listing criteria in section 7(a)(1) are so broad -- any substance that **may** occur in indoor air, **even due to a rare accident or misuse**, and have **any** adverse health impact --

that hundreds of substances will have to be reviewed by EPA, not just the prescribed 11 generally appropriate ones (with the possible exception of methylene chloride).

The ALA, again on the fifth page, demonstrates the inherent problems with health advisories by urging inclusion of the statement that there is no known safe concentration -- however "safe" is defined -- for an indoor air contaminant. Such statements are far more likely to alarm rather than enlighten the general populace.

Regarding household pesticides noted on the seventh page of the ALA testimony, in 1990 EPA reported on the Non-Occupational Pesticide Exposure Study, which examined levels of 32 pesticides in over 200 homes in two cities. EPA concluded that "the noncancer risks were generally low, and the cancer risks were in a range the Agency generally considers negligible with the possible exception of heptachlor and aldrin" (two pesticides no longer in use).

As for household solvents, also mentioned on the seventh page, 2-butoxyethanol is a safely used glycol ether found in several glass and other hard-surface cleaners. Xylenes (and other aromatics), found in paints and adhesives, are in virtually no other products used inside the home.

Finally, in his oral testimony, Dr. Godar disparaged aerosol products, claiming they contained known carcinogens and advising they be stored outside of living areas. Like other chemical specialty product forms, aerosols contain no known carcinogens and (as described above) must be labeled for any such chronic or acute hazards. The sealed container lengthens product shelf life, preserves the sterility of the contents and reduces accidental exposure. Its directional spray and controlled particle size increase efficacy and thus minimizes unnecessary emissions.

SUGGESTIONS TO IMPROVE LEGISLATION

•CSMA has serious problems with the quasi- and pre-regulatory provisions of the bill, specifically sections 7 and 8.

* One major concern is with section 7(a) which requires EPA to list all possible indoor air contaminants, so broadly defined as to include many substances regardless of frequency or ubiquity of occurrence. We strongly believe that requiring EPA to conduct an exhaustive review of all known substances would be ill-advised and that more effective strategies can be developed for actually reducing exposure to unhealthy indoor air which should address many, if not all, of the substances of concern.

Even assuming EPA were to exercise prudence in administering this section, we are concerned that some States could misinterpret, misapply, or mislead the public about this list. This could too easily be done by States requiring superfluous or contradictory labeling or restricting product use. Furthermore, the States' unlimited ability to consume EPA's limited resources, through enlarging the list by default via section 7(a)(6), would deter the Agency from performing more important tasks in this area and reinstitute the pollutant-by-pollutant approach that is now in increasing disrepute.

For these reasons, CSMA urges that section 7(a)(1) be amended by deleting "may occur or" on line 17 and adding "significant" to "adverse impact" on line 19; CSMA also recommends that section 7(a)(6) be deleted in its entirety.

- Our members also have a concern with section 7(b) which requires EPA to publish health advisories meeting six expansive criteria. As has been seen with the development of the NESHAPS program, the extensive amount of time necessary to conduct and analyze the necessary studies, coupled with the inevitable legal challenges, make chemical-by-chemical programs unworkable.

This is especially true regarding sensitive subpopulations specified in (b)(2)(C). As NIOSH has noted in earlier testimony, "the expression of the symptoms may [be] exacerbated by a variety of ergonomic, organizational and psychosocial stresses which increase worker job and life-dissatisfaction." ASHRAE, in producing Standard 62-1989 (Ventilation for Acceptable Indoor Air Quality), recognized there would always be a small percentage of employees constantly critical of their work environment (for whatever reason); therefore, the ASHRAE definition of acceptable IAQ includes the requirement only that 80% or more (of a panel of 20 untrained observers) do not express dissatisfaction.

Furthermore, EPA is already publishing a reasonable version of these "health advisories" -- Indoor Air Facts.

For these reasons, CSMA urges that section 7(b)(2) be amended by replacing "in various concentrations" in (B) and "at the full range of concentration levels" in (C) with "at concentrations usually found in human indoor environments," and that section 7(b)(4) be amended by replacing "listed contaminants" with "contaminants listed in section 7(a)(3)."

- Our final concern with the legislation is section 8, requiring EPA to develop a national IAQ response plan, which has many of the same flaws contained in section 7. When the results of the research outlined in the remainder of the bill are obtained, then it will be appropriate to develop the response plan. In addition, by focusing the response plan on a pollutant-by-pollutant approach, it does not give adequate emphasis to response actions which are technologically feasible, relatively affordable, and which stress multi-pollutant as well as single-pollutant approaches.

Also, new language in section 8(c)(9) implicates "the application of pesticides, herbicides, and disinfectants," among others, as a cause of "sick building syndrome." Since, by definition, the cause of "sick building syndrome" is unknown, this provision makes no sense.

For these reasons, CSMA urges that section 8(c)(9) be deleted, and the implementation of the response plan be delayed for four years.

CONCLUSION

We would like to close with a quote from EPA's Report to Congress on indoor air quality, which captures the essence of the issue:

> Many of the strategies for controlling indoor exposures involve simple, low cost efforts. For example, awareness of the health risks associated with environmental tobacco smoke can result in lowered exposures as a consequence of voluntary steps to reduce smoking. Also, simple maintenance and cleaning can reduce or eliminate many sources of

> biological contaminants. In other cases, it is apparent that more can be done to reduce overall exposures and risks by altering building designs and ventilation patterns than by approaching the problem source-by-source or pollutant-by- pollutant. Risks from exposures to many consumer products can be reduced by following label instructions and assuring that ventilation is adequate during use. An important role for EPA's indoor air research program is to bring these low cost control options to the attention of the public.

Industry shares that responsibility and to that end we have prepared an enclosed brochure entitled "Household Care Products and Indoor Air Quality." It advises consumers how to reduce risks from exposure to indoor air contaminants and corrects some of the misconceptions about household care products.

In addition, CSMA has recently published "The Consumer Products Handbook," also enclosed, a comprehensive guide to today's household chemical products. This booklet explains basic chemical terms that are necessary to understand how products are made and function. It provides a historic overview of this industry and its products. It explores how products are developed and tested, and how packages and labels are designed to maximize consumer safety, product shelf life, consumer education, and convenience. The booklet also discusses the problems with consumers making their own "home-made" products, the development of the poison prevention network, and the regulatory requirements that help assure product safety. It also describes the functions, benefits, and types of ingredients in numerous categories of consumer chemical products.

Finally, we request that our complete statement and the attachments thereto be made a part of the record.

cape
COUNCIL FOR AMERICAN
PRIVATE EDUCATION
1726 M Street, N.W., Suite 1102, Washington, D.C. 20036

(202) 659-0016
FAX (202) 659-0018
Joyce G. McCray
Executive Director

June 3, 1993

The Honorable Joseph Lieberman, Chairman
Clean Air and Nuclear Regulation Subcommittee
502 Hart Senate Office Bldg.
Washington, D. C. 20510

Dear Senator Lieberman,

On behalf of the Council for American Private Education, I am writing to express our grave concern about legislation being considered in your subcommittee. Federal indoor air quality and radon abatement requirements, without necessary resources, will inflict a tremendous financial burden on our schools.

CAPE is a Washington-based coalition of 14 national organizations serving private elementary and secondary schools. Member organizations are non-profit and subscribe to a policy of non-discrimination. There are currently 29 state CAPE affiliates, including Connecticut, which extend the coalition throughout the country. (These groups are listed below).

CAPE has strongly supported Congress' efforts to protect the environmental safety of children in all our nation's schools. We have consistently endorsed authorization and appropriations bills dealing with asbestos, radon, and lead in drinking water. We have supported efforts to not only require appropriate testing and abatement or management procedures, but also provide a delivery system of federal funds that allows for private schools to fully participate in grant and loan programs to perform those tasks.

If the Senate subcommittee is convinced of the current scientific data on radon, and is alarmed by the long term health effects to our children, then surely you would agree any legislative remedy must include a guarantee for full funding of required testing and remediation.

It is our hope that during the subcommittee's consideration of S. 656, you will work to insure that an equitable federal delivery system of funds be made available before any new federal mandates go in place. Thank you for your consideration.

Sincerely,

Joyce G. McCray

Joyce G. McCray
Executive Director

Members: American Montessori Society • Association of Military Colleges and Schools of the U.S. • Christian Schools International • Evangelical Lutheran Church in America • Friends Council on Education • Lutheran Church—Missouri Synod • National Association of Episcopal Schools • National Association of Independent Schools • National Association of Private Schools for Exceptional Children • National Catholic Educational Association • National Society for Hebrew Day Schools • Seventh-day Adventist Board of Education, K-12 • Solomon Schechter Day School Association • U.S. Catholic Conference, Associated state organizations in Arizona, California, Connecticut, Delaware, District of Columbia, Florida, Georgia, Illinois, Indiana, Iowa, Kansas, Maryland, Michigan, Minnesota, Missouri, Montana, Nebraska, New Mexico, New York, North Dakota, Oregon, Puerto Rico, Rhode Island, Tennessee, Texas, Virginia, Washington, and Wisconsin.

FOLIAGE FOR
CLEAN AIR
COUNCIL

Statement of
B.C. Wolverton, Ph.D.
Environmental Research Scientist
Scientific Spokesperson for the Foliage For Clean Air Council
Falls Church, Virginia

before the

Subcommittee on Clean Air and Nuclear Regulation
Committee on Environment and Public Works
United States Senate

June 11, 1993

Mr. Chairman and Members of the Subcommittee:

I welcome this opportunity on behalf of the Plants for Clean Air Council to review with you a portion of the research I have conducted during the past twenty-one years, while at the National Aeronautics and Space Administration and now as the environmental scientist for the Plants for Clean Air Council, on the use of plants and their associated root microbes for solving environmental pollution problems. I would like to highlight the ongoing research into the use of house and office plants for indoor air pollution abatement.

In August, 1989, the U. S. Environmental Protection Agency (EPA) submitted a report to Congress on the quality of indoor air found in ten public access buildings, including office buildings. This report stated that more than nine hundred organic chemicals have been identified in newly constructed buildings and that the levels of some of these chemicals were one hundred times greater than normal levels. This report also stated that "sufficient evidence exists to conclude that indoor air pollution represents a major portion of the public's exposure to air pollution and may pose serious acute and chronic health risks." EPA estimated that indoor air pollution is costing tens of billions of dollars per year in medical costs, lost earnings due to major illness, as well as increased employee sick days and lost productivity while on the job.

People living in mobile homes, the majority of which are located in rural areas, have a higher risk of developing adverse health effects from indoor air pollution. Formaldehyde concentrations measured in mobile homes range from 0.03 to 8.0 ppm, exposing over nine million mobile home residents to dangerous levels of formaldehyde for ten to twenty-four hours each day. The high surface-to-volume ratio of particle board and plywood used as building materials, along with furniture constructed with particle board, contribute to the high indoor air pollution levels found inside mobile homes. These are alarming findings and have even a greater impact during these harsh economic times.

Although EPA has done an excellent job of identifying indoor

405 N. Washington Street
Falls Church, VA 22046
(703) 534-5268

Working To Promote Plants For Cleaner Air

air pollution problems, unfortunately, no practical solutions have been offered. EPA currently suggests three methods of reducing indoor air pollution: (1) remove the polluting source, (2) increase ventilation rates, and (3) use air filtering devices. Since most office equipment and supplies, furniture, carpeting, paneling, etc. outgas low levels of polluting substances, removal of all sources of indoor air pollutants is not practical. Man, himself, is also a polluter as he emits hundreds of undesirable volatile air polluting substances known as "bioeffluents" into the environment during his normal process of living and breathing. Increasing ventilation rates will increase energy consumption for heating and air conditioning, and in some cities, polluted indoor air will be exchanged for polluted outside air.

Is there a cost-effective solution to the indoor air pollution problem? The Plants for Clean Air Council joined forces with NASA in September, 1989 in a national news conference to announce the findings of research which was published in a report entitled, "Interior Landscape Plants For Indoor Air Pollution Abatement." Since that first news conference, the Plants for Clean Air Council has received steady coverage from the media--on local, regional, national and international levels. The story of plants cleaning the air may well be the story of the 90's.

Green plants, in conjunction with microorganisms living on and around their roots, purify and revitalize the earth's atmosphere. This fundamental fact has until recently been taken for granted. Environmental groups are presently attempting to educate world leaders and the general public on the importance of trees and especially the tropical rain forests in cleaning the earth's air. If tropical rain forests, which act as the lungs for the earth, cleanse the earth's environment, why not bring plants inside tightly sealed buildings to clean the indoor environment?

There have been numerous studies conducted by plant and soil scientists over the past thirty years on agronomically important plants such as wheat which demonstrate that substances excreted from plant roots (exudates) determine the number and type of microorganisms living on and around the plant roots. The zone of soil influenced by these organic substances is termed the "rhizosphere."

Microbiologists have also demonstrated during the past thirty years the ability of soil microorganisms to biodegrade toxic organic chemicals and convert them into nontoxic metabolites. During the past ten years, environmental scientists have demonstrated the ability of house and office plants to remove indoor air polluting chemicals such as formaldehyde and xylene from sealed chambers. Plants excrete chemical substances into the rhizosphere which control the numbers and types of microorganisms living there. Different plants have different types of microorganisms living on and around their root system. Since some microbes are more effective in destroying toxic chemicals than others, this explains why some plants are more effective in removing toxic chemicals from contaminated air than others.

To take advantage of the chemical degrading powers of plant root microorganisms and to enhance the air filtering capacity of house plants, high efficiency plant filters have been developed. These filters utilize a fan to rapidly move polluted air through a filter bed of highly adsorbing materials where a plant is growing. One of the unique components of these filters is the utilization of plant roots and microorganisms to continuously biodegrade and assimilate indoor air polluting chemicals into plant tissue, thereby, bioregenerating and continuously cleaning the adsorbent filter media. It is proposed that these filters be used in conjunction with regular potted plants by placing them in areas containing high levels of air pollutants such as designated smoking rooms, computer and copying machine areas, areas with poor air circulation or "dead spots", etc. This will increase the capacity and reliability of house plants in maintaining a high quality of indoor air.

Ideally, plant/microbial filter technology will be incorporated into the design of future homes and office buildings for both wastewater treatment and indoor air purification. My own home in Picayune, Mississippi has utilized this technology successfully for over thirty months. Bathroom waste is flushed directly into a long planter trough inside a sunroom where common house plants use the waste as a continuous source of water and fertilizer. The plants not only purify and revitalize the air, but also treat the wastewater. The clean water is then pumped into an aquarium containing fish to prove the purity of the water. The first public access building to utilize this technology is now under construction on the campus of Northeast Mississippi Community College in Booneville, Mississippi. A 4,000 ft^2 area of this three story, tightly sealed building will be closed to outside air and the inside air will be purified by plants and recirculated. These plants, located on the second floor around the atrium will use bathroom waste as their water and fertilizer source. Any excess water will be piped outside to feed and water the outdoor landscaping. See Figure 1.

The adaptation of aesthetically pleasing, interior plants to purify the indoor air while utilizing wastewater as their sole source of nutrients and water while producing clean water will prove to be a major technological breakthrough in utilizing nature as an affordable means of correcting air and water pollution problems. The use of aquatic plants to treat domestic sewage and to clean wastewater is a well established art in Mississippi and Louisiana. The latest wastewater treatment system in which two million gallons per day of sewage will be farmed producing high quality protein feed products while cleaning the wastewater is under construction at Picayune, Mississippi. This aquatic plant wastewater treatment system is costing the city approximately $.16 per gallon to install as opposed to an estimated cost of over $5.00 per gallon for a mechanical system to achieve the same level of treatment. Also, a catfish farming operation near Hattiesburg, Mississippi is using nature's plant filters to triple the number of fish that can be grown in the same size lagoon while cleaning and reusing the water.

CONCLUSION

Developing affordable technology for controlling indoor air pollution and solving other environmental pollution problems represents one of the greatest challenges facing man during the twenty-first century. Interior plants and the microbes growing on their roots have demonstrated their potential as a cost-effective means of improving indoor air quality. These same plants have also proven their ability to utilize wastewater as their sole source of water and nutrients while purifying the wastewater.

Because of the potential promise of this technology as a low-cost means of solving a multi-billion dollar indoor air pollution problem, Congressional support of further research and evaluation of this concept is urgently needed. The new math/science building under construction at Northeast Mississippi Community College in Booneville, Mississippi would be an ideal test project where government and private funding could evaluate the practical applications of this promising biotechnology.

Mr. Chairman, I hope with this short presentation that I have generated enough interest by the Subcommittee to consider supporting this rapidly emerging technology as a promising, low-cost alternative to expensive, energy-intense mechanical technology for solving our environmental pollution problems. I would be pleased to respond orally or in writing to any questions you or members of the Subcommittee have pertaining to this important biotechnology.

STATEMENT FOR THE RECORD

of

THE NATIONAL ASSOCIATION OF HOME BUILDERS

Submitted to the

SENATE ENVIRONMENT AND PUBLIC WORKS

SUBCOMMITTEE ON CLEAN AIR AND

NUCLEAR REGULATION

of the

UNITED STATES SENATE

on

MAY 25, 1993

STATEMENT FOR THE RECORD
of
THE NATIONAL ASSOCIATION OF HOME BUILDERS
Submitted to the
SENATE ENVIRONMENT AND PUBLIC WORKS
SUBCOMMITTEE ON CLEAN AIR AND NUCLEAR REGULATION
of the
UNITED STATES SENATE
on
MAY 25, 1993

Mr. Chairman, on behalf of our 164,500 member companies, the National Association of Home Builders (NAHB) appreciates this opportunity to submit a written statement for the record of the Senate Environment and Public Works Subcommittee on Clean Air and Nuclear Regulation hearing regarding indoor air quality and radon issues.

In general, NAHB supports the concepts of both S.656, the Indoor Air Quality Act of 1993, and S.657, the Indoor Radon Abatement Reauthorization Act of 1993. There are, however, several issues that merit discussion and, hopefully, eventual modification. Specifically, NAHB seeks at least clarification, if not actual revisions, of provisions in the radon bill before we will fully endorse the legislation.

For purposes of this subcommittee hearing statement, each bill will be addressed individually.

S.656, THE INDOOR AIR QUALITY ACT OF 1993:

NAHB fully supports the research efforts and information distribution provisions provided for in this bill. It is vital that decisions regarding standards, techniques and equipment be based on sound scientific evidence and that the information is then accessible to the public. NAHB and its National Research Center would actively participate in the outlined grant assistance and/or cooperative agreements provisions, to help federal agencies or other interested parties ensure that the new standards are based on solid evidence, rather than arbitrary decisions.

Specifically, the research targeted toward ventilation systems is essential. Evaluating the adequacy of existing ventilation standards, the cost of compliance to those standards and the extent to which the standards are being adopted and enforced before determining the need for new standards or codes is consistent with NAHB policy. NAHB has been reluctant to support the requirement of new standards before the research has produced enough information to accurately make the determination.

The main issue of concern to NAHB in this legislation is that there are no deadlines set for completion of the research, other than those set in sections 6 and 8. In section 6(c), the

Administrator, is required to make recommendations as to the need for new ventilation standards based on the research outlined in that section, within thirty-six months after enactment. In section 8, the Response Plans, including model building codes and ventilation standards, are required twenty-four months after enactment. It is not logical that model codes and ventilation standards are required a full year before the recommendation as to whether or not they are needed. The collection and evaluation of data must be completed before codes and standards can be reliably established.

In addition, there is discussion in this bill regarding the analysis of current ventilation standards for acceptable indoor air quality, including those of professional organizations such as ASHRAE, in order to determine the adequacy of existing standards for protecting public health. Currently, a standing project committee established by ASHRAE is reviewing and updating its own 62-1989 standard, which is considered to be the authoritative ventilation standard. It is anticipated that the development of the committee's recommendations will be completed between 1994-96. Using the "current" standard, i.e. the existing ASHRAE standard, would base new findings on outdated and potentially inaccurate information.

Section 7, detailing the list of contaminants, needs modifications relating to health effects and deletion from the list. Because different contaminants may have vastly different adverse effects, it would be advisable to require that the list identify precisely what adverse effect is expected from each contaminant. Also, there are provisions for adding items to the list, but not for deleting them. The impetus of the list should be to take items off that are no longer considered a threat to human health. If a contaminant may never be deleted as more information about it becomes available, then the EPA should have final and conclusive information before it goes onto the list.

S.657, THE INDOOR RADON ABATEMENT REAUTHORIZATION ACT OF 1993:

NAHB has several concerns regarding provisions in this legislation. Although NAHB gave qualified support to the Senate's radon bill from the last Congress, we would like to see S. 657 significantly improved before endorsing the bill this year.

The Target Action Point to be established by the Administrator within 120 days after enactment is unnecessary, unless the intent of this bill is to reduce the current EPA action level of 4 pCi/L, and the basis for determining the action point is too narrowly defined. The Target Action Point is to be based on what the Administrator decides is the level of indoor radon that is "as close to the national ambient outdoor radon level that can be consistently achieved..." The national ambient outdoor level is approximately 0.4 pCi/L, and it is our understanding that EPA believes the Target Action Level would fall near 2 pCi/L based on the criteria in this bill -- well below the current EPA standard. Obviously, if the Target Action Level is to be determined within four months, it will be based on incomplete research data and on a narrow criterion.

NAHB proposes that the bill be revised to reflect the excellent work already underway by the EPA. We recommend using the criteria set forth in the preamble to the EPA Model Construction Standards (58 Fed. Reg. 68) to assist in determining the target action point. The criteria details the necessity to accomplish significant radon risk reduction in newly constructed homes, while requiring the techniques to be technically achievable, readily implementable and cost effective. This detailed and balanced approach has been established in consultation with NAHB and would greatly reduce the ambiguity present in S. 657.

NAHB is also concerned with the provisions detailing the establishment of priority radon areas. We believe the stated standard for designation will lead to areas being inaccurately defined relative to their risk. In many cases, too much area will be classified as a priority radon area, but other areas with actual high radon levels may be excluded from classification. By basing the Administrator's decision on "the reasonable likelihood that the average indoor radon level in the area is likely to exceed the national average indoor radon level by more than a de mininis amount", there is the potential for over half of the country to be designated high priority areas in the event that the language is misinterpreted or overzealously implemented. Without including soil tests, on the other hand, some areas that have a high radon level in the soil will not be included and, yet, pose the danger of exposure.

Furthermore, using the national average radon level as the guideline is inappropriate. The priority areas should be determined by the current EPA action level of 4 pCi/L instead of the national average of 1.3 pCi/L. By only having to exceed the national average by a "de minimis" amount, the Administrator could easily designate priority areas that have radon levels below the current action level and actually lower the action level without the scientific information to support the change.

We understand that it is the Committee's intention to use the Map of Radon Zones already developed by the EPA for the designation of the priority radon areas. The maps use the national residential radon studies, including soil test data, done by the U.S. Geological Survey as the basis for designating the priority areas. The maps are county specific and indicate that approximately 30% of the country would qualify under the provisions of this legislation. NAHB agrees that the approach should be to use the EPA maps and have approximately 30% of the country designated as high priority areas; however, the Committee's intentions to use the EPA maps and focussing efforts on approximately 30% of the country are not clearly identified in the bill language.

In addition, these maps qualify radon levels of concern as low (under 2 pCi/L), moderate (2-4 pCi/L) and high (over 4 pCi/L) and establish radon priority zones based on the tested level. NAHB supports this approach of prioritizing the counties so that efforts are initially directed towards the areas of greatest risk. Again referencing the preamble to the EPA Model Construction Standards (58 Fed. Reg. 68), NAHB would like to see the criterion of targeting the areas of the country with the highest radon risk potential adopted into this bill, as it was in the EPA model standard.

In section 6, there are provisions requiring that all federally assisted housing constructed two years after establishment of the model construction standards and located in a radon priority area be built to the new EPA Model Construction Standards. NAHB opposes any mandatory adoption of the EPA's Model Construction Standards at the federal level -- the requirements for federally assisted housing should parallel the approach taken for conventionally financed new home construction. In addition, the model standards already published in the Federal Register are fully voluntary until adoption as a state or local code.

NAHB also has concerns relating to the provisions addressing the disclosure of information concerning radon during the transfer of residential property. Although the language in S.657 is identical to that in Title X of the Affordable Housing Act Amendments adopted last Congress, NAHB believes its use here may be inappropriate because lead and radon are very different contaminants and mitigation measures for each pose different problems. For example, lead testing can be done instantly and the answers are immediate, definitive and representative as to the extent of the contamination. Radon tests must be done over an extended period of time in order to produce results that are truly representative of the overall radon contamination.

NAHB supports the efforts to encourage voluntary testing in all homes. Real estate transactions should not be contingent upon a radon test. However, if test results are available, and especially if the radon levels are high, this information should be disclosed to the purchaser. The tests, however, must remain voluntary.

There are several problems with tying the tests to conditions of sale. Having to disclose only the known presence of radon could be a disincentive for homeowners to test. A home owner may determine that the presence of radon, confirmed by testing, would adversely affect his ability to sell the property. He might very well choose not to test to avoid confirming an elevated radon level which would trigger disclosure that information to prospective buyers. Rather than focusing on determining the presence of radon, disclosure should be targeted toward the location of the home in proximity to the highest radon risk areas, radon risk potential and general information about contamination and testing.

NAHB cannot support the 10-day "no obligation period" outlined in this bill because it encourages the use of short-term radon tests. Short-term tests are not true indicators of year-round radon levels. Radon levels fluctuate on a seasonal, monthly, daily and even hourly basis. The temperature of a house will even alter the radon levels measured -- a warmer house means higher radon levels, cooler temperatures lower radon levels. The only way to obtain a truly accurate reading of an annual average level of radon in a home is either by long-term testing or a series of short-term tests.

EPA's Home Buyer's and Seller's Guide to Radon even says that at least two tests are needed to achieve more reliable results and short-term tests are less likely to accurately represent an average year-round indoor radon level. "... short term tests are less definitive about whether the home is at or above 4 pCi/L. ... For example, if the average of the two short-term tests is 4.1 pCi/L, there is about a 50% chance that the year-round average is somewhat below 4 pCi/L." (EPA Guide, p. 19)

To demonstrate how short-term testing can misrepresent year-round levels of radon, a study was conducted in Morris County, New Jersey by one of NAHB's members, Naomi Harley. This testing was done in conjunction with the Department of Environmental Medicine at the New York University School of Medicine. The home used was as "radon resistent" as current technology allowed and was tested at hourly intervals over a period of one year, as well as having several short term tests done throughout the year. The average annual level of radon was 2.7 pCi/L, but some of the two-day readings measured over 14 pCi/L. Anyone basing a mediation decision or a real estate transaction on the results of one of those short-term tests could have been seriously misled as to the presence of a radon problem.

In addition, NAHB would encourage the Committee to reexamine the requirement to test new construction at the time of sale. Radon measurements will drop due to occupant use, as well as after the house has been able to dry out or "settle". Again, the short-term tests encouraged in this bill would not take these issues into account.

NAHB supports provisions of this bill relating to model construction standards. We recommend that the bill include a "safe harbor" provision that would insure that the builders who build to the model construction standards adopted by the EPA Administrator are protected from liability under federal law. States also should be encouraged to adopt such a provision in their legislation. We believe that this protection will ensure that the model construction standards, which are state of the art standards, are widely accepted. Builders will want to use these standards knowing that they will be protected from liability in the future.

With respect to liability, we cannot support the civil liability provisions set forth in section 313. A seller who knowingly violates the information disclosure requirements would be liable in an amount equal to three times the amount of damages incurred by a "mortgage applicant, purchaser or lessee." We recommend that the damages be limited to actual damages. Furthermore, the term "mortgage applicant" should be deleted because such persons may or may not be actual purchasers. There is no reason mortgage applicants should be awarded damages since there is no evidence that such persons actually resided in the dwelling unit. Therefore, only purchasers or lessees should be entitled to damages under this section.

NAHB also recommends revision to section 20 which authorizes citizen suits for violation of sections 313 and 314. Section 313 already provides that an aggrieved purchaser or lessee may bring an action against a seller for failure to disclose radon hazards in housing. There is no reason to allow any person, not a purchaser or lessee, to bring an action against a seller for failure to disclose known radon hazard information to a purchaser or lessee.

NAHB applauds the research efforts outlined in the Indoor Air Quality Act of 1993 and stresses how important it is that research precede any changes made to existing building codes and ventilation standards. There is the need for minor modifications, but S. 656 has the support of NAHB.

Regarding the Indoor Radon Abatement Reauthorization Act of 1993, however, NAHB cannot support the bill in its current form. There are too many issues that need to be addressed before the bill accomplishes the goal of radon abatement in an equitable and practical manner. Specific attention needs to be paid to the sections regarding radon information disclosure, designation of radon priority areas and civil penalties.

NAHB looks forward to the opportunity to work with the members and staff of this Committee to establish indoor air quality and radon programs that will reduce the risk to human health and broaden our knowledge of the current situation and problems that may exist. The goal or reducing human exposure to indoor air contaminants and radon in particular, however, must be obtained reasonably and through the practical application of existing technologies.

Thank you, Mr. Chairman.

STATEMENT OF
NATIONAL ASSOCIATION OF REALTORS®
SUBMITTED TO THE
SENATE ENVIRONMENT AND PUBLIC WORKS
SUBCOMMITTEE ON
CLEAN AIR AND NUCLEAR REGULATION
MAY, 1993

INTRODUCTION

The NATIONAL ASSOCIATION OF REALTORS®, is comprised of nearly 750,000 members involved in all aspects of the real estate industry, has a keen interest in the issue of radon gas.

REALTOR® ACTIVITIES

The NATIONAL ASSOCIATION OF REALTORS® had an early role, and continues to play a very active and positive role in the radon issue. Our radon awareness program began in August of 1985, well before radon gained national attention. We produced and distributed thousands of radon information kits to REALTORS® and the public one year prior to the publication of the U.S. Environmental Protection Agency's (U.S. EPA) radon booklets. In 1986, one of our state association executives accompanied, Senator Frank Lautenberg (D-NJ) on a radon fact-finding mission to Sweden. Since that time, we have continued to meet regularly with officials of the U.S. EPA to discuss various technical and public awareness problems related to radon gas.

Over the past several years, we have conducted many radon education sessions at our national conferences. Representatives from the U.S. EPA have participated in these sessions, as well as representatives from the U.S. Department of Energy and the radon industry. We have worked with EPA on the Citizen's Guide and the Home Buyer's and Seller's Guide. In a similar vein, the NATIONAL ASSOCIATION OF REALTORS® worked with Fannie Mae and the other shelter industry groups in the development "A Home Buyer's Guide To Environmental Hazards." This was developed to provide consumers with a booklet on real estate and environmental hazards.

EPA has briefed the REALTORS® Legislative Environment Committee and has participated in education sessions and REALTOR® Conventions.

NAR RADON AND INDOOR AIR POLICY

The NATIONAL ASSOCIATION OF REALTORS® strongly believes that every individual should have the opportunity to live in safe and decent housing where risks to health from pollution are minimized. A public health issue, such as radon, is obviously a priority for the real estate industry because we are concerned with the potential long term health effects associated with radon gas. We are committed to taking an active role in attempts to reduce the potential health threat that radon gas may pose, while at the same time protecting the value and salability of homes. NAR supports comprehensive federal legislation that increases the role of government in indoor air quality research and public information dissemination.

The U.S. EPA estimates that a significant number of lung cancer deaths per-year are caused by radon gas. Because of this potential public health threat, we join EPA in urging all Americans to test their homes to determine if elevated levels of radon gas are present.

We support increased education of homeowners so that they will become aware of potential radon problems and of their responsibility to disclose to real estate brokers or agents indoor air problems that present a significant risk to health. We encourage our state associations and local boards to conduct educational programs for their membership similar to our national programs.

We support and encourage efforts by state REALTOR® associations to determine the desirability of disclosure language, relating to a wide variety of conditions including but not limited to radon, in listings and contracts of sale. To that end, the NATIONAL ASSOCIATION OF REALTORS® has adopted the following policy: "The NATIONAL ASSOCIATION OF REALTORS® encourages state Associations to develop and support legislation or regulation requiring mandatory property condition disclosure by the seller. "

With the adoption of the above policy statement, the NATIONAL ASSOCIATION OF REALTORS® believes that the issue of radon would be best addressed as a part of the property sellers mandatory property condition disclosure obligation. With that in mind, the NATIONAL ASSOCIATION OF REALTORS® has also adopted the following policy:

RADON POLICY APPROVED BY THE NATIONAL ASSOCIATION OF REALTORS® -- APRIL 27, 1993

- The NATIONAL ASSOCIATION OF REALTORS® strongly opposes any form of mandatory testing tied to the real estate transaction process. A decision to test or not test should be left to the discretion of the seller/lessor and potential purchaser/lessee; premises may be tested only if mutually agreed upon by the parties. We support the right of buyers and sellers to freely negotiate the terms of their sales contract and oppose any efforts to impose a federally-mandated time frame for radon gas testing at the time of sale of a residential property. If the purchaser/lessee demands a test, it would be at their expense and they would have to provide seller/lessor with a copy of the test results. NAR would not oppose legislation which included the following:

A. Single-family and multi-family sales of homes:

- Seller disclosure: Before entering into the sales contract, it is the responsibility of the seller to:

1. provide a radon hazard information pamphlet;
2. disclose any known radon hazard in the premises, as well as, any radon inspection report of which the seller is aware.

The purchaser shall sign a statement acknowledging that he/she has received a radon hazard information pamphlet from the seller. We feel that a radon warning statement in the contract is unnecessary.

B. Leasing of single and multi-family properties:

- Lessor disclosure: Before entering into a lease, it is the responsibility of the lessor to:
  1. provide a radon hazard information pamphlet;
  2. disclose any known radon hazard in the premises, as well as, any radon inspection report of which the lessor is aware.

C. General concepts to be included in any radon legislation passed by Congress:

1. Any federal radon gas legislation should be based on scientific evidence verifying radon's harmful effect on humans.
2. NAR encourages owners to take voluntary action to remediate radon.
3. NAR supports the addition of language to the bill limiting the liability of sellers and lessors who comply with the bill's provisions. We support the addition of the following language:

> "A seller or lessor of residential property and/or their agent shall have no liability under this Act or any other provision of Federal, state, local or common law for any radon-related injury, property damage, or mitigation expenses resulting from occupancy of the premises sold or leased if the seller or lessor has complied with the requirements of this Act."

4. NAR supports federal financial incentives and relief to encourage the remediation of radon in residential premises.

5. NAR opposes making radon testing a pre-requisite for qualifying for any federally-backed mortgage insurance or guarantee under the Federal Housing Administration, Farmers Home Administration, the Department of Veterans Affairs, or any other governmental or quasi-governmental entity. We oppose efforts to prohibit the making of a federally-related mortgage loan on residential properties located in areas identified to be affected by radon gas if such a property can be shown through appropriate testing methods to meet indoor air quality guidelines for radon as established by the appropriate federal agency.

6. NAR supports the inclusion of legislative or regulatory language prohibiting lending and insurance institutions from refusing to lend or grant liability insurance on properties solely because of any presence of radon.

7. Some states already require the distribution of environmental hazard pamphlets as part of state-mandated real estate disclosure laws. Federal legislation should allow such state pamphlets to be considered "substantially equivalent" to avoid unnecessary duplication and confusion among residential consumers.

8. Legislation which requires that warning statements in contracts be "read and understood" creates potential liability problems for sellers, lessors and their agents. It should be sufficient that the purchaser/lessee acknowledge that they have received the information since it would not be possible for the seller/lessor, or their agent, to determine the extent to which potential purchasers/lessees have fully comprehended the information. This would be especially true in states which have large non-English speaking populations.

The association also adopted the following statement, "that the NATIONAL ASSOCIATION OF REALTORS® initiate action through the U.S. EPA as well as through Congress to change the radon requirements for testing to the lowest living level rather than the basement level."

NAR applauds the efforts of Senate Majority Leader George Mitchell (D-ME) and Senator Frank Lautenberg (D-NJ) for their efforts on S. 656, the "Indoor Air Quality Act" and S. 657, the "Indoor Radon Abatement Reauthorization Act of 1993" respectively. NAR's policy supports the concept of research and development with regard to indoor air quality; however, our policy regarding the radon issue is not in concert with the language contained in the "Indoor Radon Abatement Reauthorization Act of 1993".

SELLER DISCLOSURE

A few states, by law, mandate that radon disclosure language be included in all real estate contracts of sale. In other areas, disclosure language is commonly used in all transactions. At present, at least eleven states have statutory or regulatory property condition disclosure requirements, and legislative efforts are under way in a significant number of other states to adopt similar requirements. The rational for mandatory disclosure is two fold: it protects both the consumer as well as the real estate agent. It is important to note, however, that because it is the seller who has the most intimate knowledge of the home, seller disclosure appropriately places the legal liability for alleged misrepresentations about the condition of the property more squarely on the seller's shoulders.

In order to facilitate this process several state REALTOR® associations, in conjunction with legislative and/or regulatory activities, have developed sample disclosure forms for REALTORS® to use. Samples are attached for your review (Appendix A). As you will note, radon is simply one of the many environmental hazards addressed by these forms, which also address structural concerns, neighborhood noise problems, and zoning violations.

IMPACT OF RADON ON REAL ESTATE TRANSACTIONS

Much attention has been paid to concerns over the presence of radon and its relation to property values. We have not seen a major decline in property values due to the presence of radon gas in those areas associated with elevated levels of naturally occurring radon, however if legislation were implemented to require high risk areas to test for radon it might stigmatize an area, thus reducing the value of the property.

The cost of mitigating radon can run as much as $2,500, although the average has been estimated to be about $1,200. This is relatively modest in comparison to the median price of a home ($103,700 for an existing home and $121,000 for a new home). However, if mandated during the real estate transaction, this cost would impact the affordability of a home, particularly for lower income, first-time homebuyers. NAR estimates that the median price of a starter home in 1992 was $88,100, and that the typical potential first-time homebuyer had only 82% of the income necessary to qualify to purchase such a home. The additional cost of mitigating radon would drop this number to only 79% of the necessary income, pricing quite a few purchasers out of the market.

The above is based on the assumption that the cost of radon testing and mitigation could be financed as part of the mortgage on the purchased home. However, this is not a very realistic assumption. We have not seen an increase in property appraisals after radon mitigation. Since the size of the mortgage is based on the appraisal price, it is not likely that mitigation can be financed through a mortgage. Therefore, in order to mitigate at the time of transaction, the buyer would need to have this money on hand before the transaction is completed. This will have a major impact on the ability of many families to purchase a home.

The accumulation of a down payment and closing costs is the principal impediment to the home purchase process. Many households can afford the monthly debt service of a mortgage, however, they have not accumulated sufficient savings for the upfront costs. The accumulation of the down payment is much harder for first-time homebuyers. The median first-time homebuyer in 1991 put down $5,000 for a home purchase. Adding radon testing and mitigation costs to this could be an increase of 50%, placing a huge burden on these purchasers.

DELAYS IN CLOSINGS

The primary impact that radon has on the real estate industry is the impact of a demand for radon testing or monitoring prior to contracting for or closing on a property. In those areas of the country where radon is a prominent issue, it is becoming more common for a prospective buyer to request a radon test prior to closing. Often, testing is carried out during the time it takes for the mortgage application, property appraisal, survey, etc. to be completed. However, problems can occur when there are delays in obtaining testing equipment and ensuring a timely laboratory analysis of the samples taken. These problems can be compounded if an unacceptable radon level is found and retesting and mitigation are required prior to closing.

RELIABILITY OF TEST RESULTS

Another problem associated with reliance on the real estate transaction as a time to assess radon in the home is the matter of the reliability and credibility of radon testing done at that time. When a test is done in anticipation of or as required for a real estate transaction, the seller's control of the home--and therefore control over testing conditions--inherently creates a reasonable concern by the buyer of the reliability of the results. Even ignoring the possibility of intentional manipulation of testing protocols or house conditions to affect test results, the seller is likely to be less inclined or motivated to scrupulously adhere to proper procedures, since his health and that of his family is not dependent on the results of the test. The buyer, on the other hand, has both economic and health related interests in obtaining correct test results. Thus, effective testing and mitigation is best done at a time without the pressures injected by a pending real estate transaction, and when the party most affected has the ability to control testing conditions and, correspondingly, test results. For this reason, therefore, the time of a real estate transaction is one of the least desirable times to address the question of radon in the home.

DUTIES OF REAL ESTATE AGENTS

Since the awareness of the potential health hazard caused by elevated levels of radon gas in the home first surfaced with the discovery of the Watriss house, real estate brokers and agents alike have begun to consider the nature and extent of their duty to consumers regarding the presence, or possible presence, of radon in homes. Unfortunately, several factors make it difficult for real estate agents to clearly understand and perform their legal obligations regarding the presence of radon or other like environmental conditions.

First, the legal obligation of a real estate agent to a customer relative to undiscovered or latent material defects of adverse features of a property is generally established by state law. Moreover, in many jurisdictions, this area of the law is dynamic and evolving, with issues and questions yet to be resolved. There exists no general uniformity in the extent to which an agent is required to identify and disclose material features and aspects of the property which the customer might find undesirable or unacceptable. Often there is little or no judicial consistency or predictability with respect to these issues, even within a given jurisdiction.

Second, the problem of radon is particularly difficult since testing is not standardized and controversy remains over the health implications of low radon levels detected by tests. Thus, even where the broker's legal duties can be specifically prescribed, satisfactory performance thereof may be inhibited by the difficulty of obtaining reliable test data or uncertainty in the proper use of such data in ascertaining the potential risks faced by a customer.

Finally, real estate brokers and sales people are employed to function as property marketing agents, not as experts in technical issues regarding the implications of environmental conditions such as radon. Thus, although licensed by the state to perform that marketing function, real estate agents may nevertheless be relied upon by prospective purchasers as a source, perhaps the only source, of environmental information and counsel which the agent is ill trained to provide.

Accurate and detailed information about the radon levels in a home usually assists the prospective buyer, seller, and broker, since buyers increasingly seek such information about homes in which they may be interested. In conducting tests for radon, properly established and controlled conditions are critical to the accuracy of the test. Even where that information can reliably be obtained within the brief time frame applicable to a real estate transaction, the obligation to test should not, cannot, and presently is not imposed on the broker. The broker has no inherent authority nor capacity to properly perform such a test in the home. The establishment of such a testing duty without the corresponding ability to perform that duty, and to do so accurately is inherently unreasonable and unjust.

In those instances where a broker has knowledge that elevated levels of radon gas exist in a home, we acknowledge that the broker has an ethical and legal obligation to disclose that fact to any prospective buyers. In some circumstances, it may be prudent, helpful or even legally or ethically necessary that a broker provide a buyer and/or seller with information regarding the possible presence of radon in a home, and the consequences which may result from extended exposure to elevated radon levels. But in no case does or should the broker's legal or ethical duty go any further, since he is ordinarily not trained, nor required by law to be trained in technical matters such as radon discovery, mitigation, or health hazards. The broker is not a qualified source of professional guidance for a home buyer regarding the risks attendant to radon in a particular home, even though buyers often may not properly evaluate and deal with those risks.

CONCLUSION

The emphasis on the real estate transaction as a means of identifying properties which have radon hazards is inadequate, since it fails to identify those properties which are not the subject of a transaction. The NATIONAL ASSOCIATION OF REALTORS® strongly supports voluntary testing and disclosure of all known facts about radon in a given area. However, it must be remembered that REALTORS® do not possess the knowledge or expertise beyond the scope of what is required for a real estate license.

While many may find it appealing to link mandatory testing for radon to the time of transaction, this will only affect a small percentage of the homes nationwide. Presently, there are roughly 100 million housing units in the United States. In 1992, approximately 4.1 million housing units were transacted. It can be expected, therefore, that mandatory testing at the time of transaction will discover only a very small percentage of the potentially affected homes. In addition, it must be recognized that the homes sold in any given year include many that have already been subject to recent transactions. A radon strategy closely linked to transactions is unlikely to be successful in obtaining mitigation of the problem in most of the affected homes, even over an extended period of time because of the limited number of transactions that occur and re-occur each year.

The NATIONAL ASSOCIATION OF REALTORS® supports the use of incentives, to motivate homeowners to test for radon gas. As a means to that end, we support efforts to allow homeowners who itemize deductions on their federal income tax return to deduct the cost of radon testing and mitigation with other medical deductions. We also support the development of radon tax credits, similar to energy tax credits, for testing and mitigation of elevated levels of radon gas. Before mandatory testing is required, Congress and the agencies need to thoroughly explore all voluntary options and incentives to motivate homeowners to test. Thus, we believe that mandating seller disclosure will provide for the health of our citizen's while also alerting the public to a series of not only environmental concerns, but also to other home buying concerns.

Thank you for the opportunity to express our views.

NOTE: The attachments to this statement have been retained in committee files.

NSBA

OFFICE OF FEDERAL AND NATIONAL
EDUCATION ISSUES ADVOCACY

Michael A. Resnick
Associate Executive Director
Lynne Glassman
Director, Network Operations
Edward R. Kealy
Director, Federal Programs
Katrina A. Kelley
Director, Urban School District Advocacy
Laurie A. Westley
Chief Legislative Counsel
William B. Bruno
Executive Branch Advocate

William M. Soult
President
Thomas A. Shannon
Executive Director
Harold P. Seamon
Deputy Executive Director

1993 JUN -7 PM 5:49

June 7, 1993

The Honorable Joseph I. Lieberman
United States Senate
316 Hart Senate Office Building
Washington, DC 20510

Dear Senator Lieberman:

The Indoor Radon Abatement Act of 1993, S. 657, sponsored by Senator Frank Lautenberg (D-NJ) takes some useful steps in examining the environmental hazard of radon and determining ways to abate the problem. However, the National School Boards Association (NSBA) is concerned that inclusion of unfunded mandatory radon testing in schools is premature and urges the deletion of section nine in S. 657.

NSBA supports the great need for increased reliability of testing devises and cost-effective mitigation. NSBA also supports acquiring a deeper understanding of the effects of low level radon -- an issue even EPA's Science Advisory Board has characterized as "containing great uncertainties." By mandating testing in the schools with less than reliable testing devises and before schools can give parents solid information about the effects of radon on children, the legislation is likely to lead to panicked, costly and potentially ineffective responses on the part of the schools.

In light of the EPA's recent statements that children are at no greater risk than adults and that the effect of radon exposure actually declines over time, there is a substantial question as to why schools would be the initial target for mandatory radon testing. This is particularly true since almost 20 percent of schools have tested voluntarily and through the age of 18, children spend only nine percent of their time in school.

EPA has been actively advocating mandatory school testing. However, they are operating on a faulty assumption because the testing in schools that EPA has conducted does not test exposure to children. Since the tests measure the amount of radon in the classroom during evenings and weekends, when the ventilation system is turned down considerably, there is a fallacy in EPA's description of the problem. That fallacy is depicted in the attached graph from the National Cancer Institute: there are high levels of radon present during the evenings and weekends when children are not in the school and it drops off significantly during the day when children are present.

NATIONAL SCHOOL BOARDS ASSOCIATION
1680 Duke Street, Alexandria, Virginia 22314 • (703) 838-6722
FAX (703) 683-7590

The Honorable Joseph I. Lieberman
June 7, 1993
Page Two

Our schools cannot afford another asbestos fiasco, wherein schools were compelled to test and abate before enough was understood. We are now discovering that premature action to abate asbestos may have actually increased the environmental risk for children. Let us not act prematurely with radon.

Since this bill includes absolutely no federal funds for testing, each school building will spend up to $1,500 to test in addition to training and administrative costs, plus between $5,000 and $200,000 for mitigation. As you well know, schools have been hard hit by declining property taxes and state budgets that have cut school funding. To add the burden of an unfunded federal mandate when there are increased demands on schools to become world class learning institutions would create an impossible situation. Asking schools to spend millions of scarce educational dollars on an environmental hazard with too many unanswered questions is unwise.

The National School Boards Association seeks a deletion of section nine from S. 657 -- the mandatory schools testing provision. NSBA supports other provisions of the bill that will, over the life of this reauthorization, improve radon testing and abatement technology as well as improve our understanding of low-level radon exposure, especially in children. When this improved technology and information is available, schools will be able to determine effectively how to participate.

If you have questions, please contact Laurie A. Westley, NSBA's Chief Legislative Counsel at 703-838-6703.

Sincerely,

William M. Soult
President

Thomas A. Shannon
Executive Director

1943-1993
SMACNA
Celebrating 50 Years of Excellence

Statement
of
The Sheet Metal and Air Conditioning Contractors'
National Association, Inc., SMACNA
on
S. 656
The Indoor Air Quality Act of 1993
to
The Senate Environmental and Public Works Committee
Clean Air and Nuclear Regulation Subcommittee
May 1993

SHEET METAL AND AIR CONDITIONING CONTRACTORS' NATIONAL ASSOCIATION, INC.
HEADQUARTERS: 4201 LAFAYETTE CENTER DRIVE • CHANTILLY, VIRGINIA 22021-1209
MAILING ADDRESS: P.O. BOX 221230 • CHANTILLY, VIRGINIA 22022-1230
PHONE (703) 803-2980 • FAX (703) 803-3732

The Sheet Metal and Air Conditioning Contractors' National Association, Inc., (SMACNA) is supported by more than 5,000 construction firms engaged in industrial, commercial, residential, architectural and specialty sheet metal and air conditioning contracting throughout the United States. SMACNA submits this statement in support of S. 656 the "Indoor Air Quality Act of 1993".

INDOOR AIR QUALITY

Indoor air quality has been a concern of SMACNA for many years. In 1988, after much research, we published the first edition of our "Indoor Air Quality" Manual. During research, prior to developing and publishing the manual, we discovered that a leading contributor to the problem of indoor air quality is the country's effort to reduce energy usage in buildings. Better insulation and reduced ventilation have saved energy, but have also trapped contaminants within buildings.

Among the major assumptions of this bill and its House companion H.R. 1930, is that exposure to indoor air contamination can be reduced through the proper design, operation, and maintenance of heating, ventilating, filtration, and air conditioning systems in buildings. The goals of the legislation are clearly achievable based upon the ventilating requirements of the American Society of Heating, Refrigeration and Air Conditioning Engineers (ASHRAE) Standard 62-1989. The problem now is how to achieve adequate ventilation to improve indoor air quality without sacrificing the energy savings achieved by energy conservation measures.

ENERGY MANAGEMENT

SMACNA is heavily involved in the energy management field and is constantly seeking new methods to achieve improved indoor air quality and energy efficiency. The concepts of IAQ and energy efficiency are inextricably linked. To increase energy efficiency and conservation without addressing subsequent IAQ problems would be a misguided policy approach with potentially harmful health outcomes. It is import to emphasize that the ability and technology exists today to accomplish the goals of Indoor Air Quality Act of 1993. We are pleased therefore that the legislation now emphasizes this dual goal focus on air quality and energy efficiency.

As an illustration, included with this written statement is a study involving a 100,000 square foot office building in the Washington, D.C. area which demonstrates a minimal increase in energy costs for increased exchange of outside air.

VENTILATION RATES, INDOOR AIR QUALITY AND ENERGY MANAGMENT

SMACNA was involved with the research and development of the ASHRAE standard 62-1989 and we recommend that this standard be specifically referenced as criteria for Federal and public buildings. The ASHRAE standard provides a flexible, comprehensive design basis which takes into account controlling known and specifiable contaminants. When certain contaminants are expected, the ASHRAE standard will increase the minimum amount of outdoor air accordingly.

While S. 656 in silent on ventilation rates, it requires identification and research into existing ventilation standards adopted by state and local governments and professional organizations including ASHRAE. While these standards may include those directed at increasing ventilation rates which will dilute the indoor air contaminants, the ASHRAE standard is a comprehensive approach that considers source control and filtration as well. This additional control requires less ventilation air to achieve the same result, which also means lower energy costs. The legislation, in Section 6(c), would would have the Environmental Protection Agency (EPA) conduct 36 months of research and assessment on ventilation standards. only then would EPA recommend a ventilating program specifying improvements in air quality, energy conservation and building operations.

There is some concern that an increase in the ventilation rates in existing buildings would force the building owners to provide additional heating and/or cooling equipment. The ASHRAE study which generated Standard 62-1989 indicated that most buildings in existence today have been designed to handle increased loads utilizing outside air by adjusting operating procedures rather than more costly retrofitting. ASHRAE's comprehensive, total building approach to determining IAQ remedies takes into consideration energy efficiency and the sources of the building's IAQ problem as well as cost consideration.

CERTIFICATION

Another concern is that there may be a lack of standards and/or protocol for certifying a building for compliance to indoor air quality standards. The ASHRAE Standard 62-1989 provides tables for minimum acceptable levels of various contaminants for indoor, outdoor, and industrial workplaces. The tables list all the presently known contaminants that contribute to health problems. All of these contaminants are measurable at any point in the building by instrumentation currently available.

In addition, measuring the amount of ventilation is a relatively simple process. All heating, ventilating and air conditioning systems in use today provide for mixing recirculated air from the building with outdoor air prior to doing any mechanical heating or cooling. The percentage of outdoor air is a simple proportion of the resultant mixed air temperature. Also, many buildings today are equipped with computerized monitoring systems which may be programmed to perform this calculation and maintain any records which might be required under Section 8(g) for certification purposes.

OTHER OBSERVATIONS

SMACNA supports the goals of S. 656 and H.R. 1930 and is supportive that many of the provisions of the bill are aimed at research development, and administrative processes as well as designing a response and demonstration plan attacking the problem directly. As we have testified to in previous Congressional hearings it would be more effective to expand on the large quantity of existing IAQ research rather than funding basic research on areas well documented by ASHRAE and others.

In particular the following sections should be considered with the above concept in mind:

Indoor Air Quality Research

SMACNA encourages further research in this area but believes that reviewing the comprehensive standard approach represented by ASHRAE's standards should be the first goal. This should be followed by research to confirm those standards or to establish additional requirements. SMACNA is capable of providing much of the research specified. However, we suggest that the primary research goal should be focused on improving ventilation.

Management Practice and Ventilation Standards

Section 6(b) describes training for the maintenance of records concerning indoor air quality. We urge that such records include operating details which include the percentage of outside air used for ventilation. The majority of building owners will reduce ventilation air whenever possible to reduce their energy costs. Any program which does not require such documentation will probably be difficult, if not impossible to enforce and of marginal value.

Section 6(c) 2(A) contains the most critical provisions in the legislation - research identification and analysis of existing ventilation standards adopted by state and local governments and professional organizations including ASHRAE. The Federal ventilation and building management program would result from this important exercise.

State and Local Indoor Air Quality Programs

In Section 10(a) it appears that the focus is centered on duplicative administrative functions rather than program implementation. We believe that the vast majority of expenditures to state and local governments should be in the form of demonstration grants and incentives to adopt indoor air quality standards once issued. Section 10(a)(3)(f) of the bill provides for educating "designing and engineering professionals, about indoor air contamination. We believe that the design community and responsible contractor groups, such as SMACNA, are already at the leading edge of this technology and that this money should be spent on additional research and demonstration efforts.

CONCLUSION

SMACNA appreciates this opportunity to comment for the hearing record on the Indoor Air Quality Act of 1993. We endorse S. 656 and urge its immediate adoption as a reasoned and overdue response to our nation's indoor air quality problems.

II

103D CONGRESS
1ST SESSION

S. 656

To provide for indoor air pollution abatement, including indoor radon abatement, and for other purposes.

IN THE SENATE OF THE UNITED STATES

MARCH 25 (legislative day, MARCH 3), 1993

Mr. MITCHELL (for himself, Mr. CHAFEE, Mr. LAUTENBERG, and Mr. LIEBERMAN) introduced the following bill; which was read twice and referred to the Committee on Environment and Public Works

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A BILL

To provide for indoor air pollution abatement, including indoor radon abatement, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

SECTION 1. SHORT TITLE AND TABLE OF CONTENTS.

(a) SHORT TITLE.—This Act may be cited as the "Indoor Air Quality Act of 1993".

(b) TABLE OF CONTENTS.—The table of contents of this Act is as follows:

Sec. 1. Short title and table of contents.
Sec. 2. Findings.
Sec. 3. Purposes.
Sec. 4. Definitions.
Sec. 5. Indoor air quality research.
Sec. 6. Management practices and ventilation standards.

Sec. 7. Indoor air contaminant health advisories.
Sec. 8. National indoor air quality response plan.
Sec. 9. Federal building response plan and demonstration program.
Sec. 10. State and local indoor air quality programs.
Sec. 11. Office of Indoor Air Quality.
Sec. 12. Council on Indoor Air Quality.
Sec. 13. Indoor air quality information clearinghouse.
Sec. 14. Building assessment demonstration.
Sec. 15. State and Federal authority.
Sec. 16. Authorization of appropriations.

SEC. 2. FINDINGS.

The Congress finds that—

(1) Americans spend up to 90 per centum of a day indoors and, as a result, have a significant potential for exposure to contaminants in the air indoors;

(2) exposure to indoor air contamination occurs in workplaces, schools, public buildings, residences, and transportation vehicles;

(3) recent scientific studies indicate that pollutants in the indoor air include radon, asbestos, volatile organic chemicals (including, formaldehyde and benzene), combustion byproducts (including, carbon monoxide and nitrogen oxides), metals and gases (including, lead, chlorine, and ozone), respirable particles, biological contaminants, microorganisms, and other contaminants;

(4) a number of contaminants found in both ambient air and indoor air may occur at higher concentrations in indoor air than in outdoor air;

(5) indoor air pollutants pose serious threats to public health (including cancer, respiratory illness, multiple chemical sensitivities, skin and eye irritation, and related effects);

(6) up to 15 per centum of the United States population may have heightened sensitivity to chemicals and related substances found in the air indoors;

(7) radon is among the most harmful indoor air pollutants and is estimated to cause between five thousand and twenty thousand lung cancer deaths each year;

(8) other selected indoor air pollutants are estimated to cause between three thousand five hundred and six thousand five hundred additional cancer cases per year;

(9) indoor air contamination is estimated to cause significant increases in medical costs and declines in work productivity;

(10) as many as 20 per centum of office workers may be exposed to environmental conditions manifested as "sick building syndrome";

(11) sources of indoor air pollution include conventional ambient air pollution sources, building materials, consumer and commercial products, combus-

tion appliances, indoor application of pesticides and other sources;

(12) there is not an adequate effort by Federal agencies to conduct research on the seriousness and extent of indoor air contamination, to identify the health effects of indoor air contamination, and to develop control technologies, education programs, and other methods of reducing human exposure to such contamination;

(13) there is not an adequate effort by Federal agencies to develop response plans to reduce human exposure to indoor air contaminants and there is a need for improved coordination of the activities of these agencies;

(14) there is not an adequate effort by Federal agencies to develop methods, techniques, and protocols for assessment of indoor air contamination in non-residential, non-industrial buildings and to provide guidance on measures to respond to contamination; and

(15) State governments can make significant contributions to the effective reduction of human exposure to indoor air contaminants and the Federal Government should assist States in development of programs to reduce exposures to these contaminants.

SEC. 3. PURPOSE.

The purposes of this title are to—

(1) develop and coordinate through the Environmental Protection Agency and at other departments and agencies of the United States a comprehensive program of research and development concerning the seriousness and extent of indoor air contamination, the human health effects of indoor air contaminants, and the technological and other methods of reducing human exposure to such contaminants;

(2) establish a process whereby the existing authorities of Federal statutes will be directed and focused to assure the full and effective application of these authorities to reduce human exposure to indoor air contaminants where appropriate;

(3) provide support to State governments to demonstrate and develop indoor air quality management strategies, assessments, and response programs; and

(4) to authorize activities to assure the general coordination of indoor air quality-related activity, to provide for reports on indoor air quality to Congress, to provide for assessments of indoor air contamination in specific buildings by the National Institute for Occupational Safety and Health, to assure that

data and information on indoor air quality issues is available to interested parties, to provide training, education, information, and technical assistance to the public and private sector, and for other purposes.

SEC. 4. DEFINITIONS.

For the purposes of this title, the term—

(1) "Agency" means the United States Environmental Protection Agency;

(2) "indoor" refers to the enclosed portions of buildings including non-industrial workplaces, public buildings, Federal buildings, school, commercial buildings, residences, and the occupied portions of vehicles;

(3) "indoor air contaminant" means any solid, liquid, semisolid, dissolved solid, biological organism, aerosol, or gaseous material, including combinations or mixtures of substances in indoor air which may reasonably be anticipated to have an adverse effect on human health;

(4) "Federal agency" or "agency of the United States" means any department, agency or other instrumentality of the Federal Government, including any independent agency or establishment of the Federal Government or government corporation;

(5) "Federal building" means any building which is used primarily as an office building, school, hospital, or residence that is owned, leased, or operated by any Federal agency and is over ten thousand square feet in area, any building occupied by the Library of Congress, the White House and the Vice Presidential residence, and any building that is included in the definition of Capitol Buildings under section 193m(1) of title 40, United States Code;

(6) "Administrator" means the Administrator of the Environmental Protection Agency;

(7) "Administration" means the Occupational Safety and Health Administration;

(8) "Director" means the Director of the National Institute of Occupational Safety and Health;

(9) "local education agency" means any educational agency as defined in section 198 of the Elementary and Secondary Education Act of 1965 (20 U.S.C. 3381); and

(10) "local air pollution control agency" means any city, county, or other local government authority charged with the responsibility for implementing programs or enforcing ordinances or laws relating to the prevention and control of air pollution including indoor air pollution.

SEC. 5. INDOOR AIR QUALITY RESEARCH.

(a) AUTHORITY.—(1) The Administrator shall, in coordination with other appropriate Federal agencies, establish a national research, development, and demonstration program to assure the quality of air indoors and as part of such program shall promote the coordination and acceleration of research, investigations, experiments, demonstrations, surveys, and studies relating to the causes, sources, effects, extent, prevention, detection, and correction of contamination of indoor air.

(2) In carrying out the provisions of this section, the Administrator is authorized, subject to the availability of appropriations, to—

(A) collect and make available to the public through publications and other appropriate means, the results of research, development and demonstration activities conducted pursuant to this section;

(B) conduct research, development and demonstration activities and cooperate with other Federal agencies, with State and local government entities, interstate and regional agencies, other public agencies and authorities, nonprofit institutions and organizations and other persons in the preparation and conduct of such research, development and demonstration activities;

(C) make grants to the States or to local government entities, to other public agencies and authorities, to nonprofit institutions and organizations, and to other persons;

(D) enter into contracts or cooperative agreements with public agencies and authorities, nonprofit institutions and organizations, and other persons;

(E) conduct studies, including epidemiological studies, of the effects of indoor air contaminants or potential contaminants on mortality and morbidity and clinical and laboratory studies on the immunologic, biochemical, physiological, and toxicological effects including the carcinogenic, teratogenic, mutagenic, cardiovascular, and neurotoxic effects of indoor air contaminants or potential contaminants;

(F) develop and disseminate information documents on indoor air contaminants describing the nature and characteristics of such contaminants in various concentrations;

(G) develop effective and practical processes, protocols, methods, and techniques for the prevention, detection, and correction of indoor air contamination and work with the private sector, other governmental entities, and schools and universities to encourage the development of innovative techniques to improve indoor air quality;

(H) construct such facilities and staff and equip them as may be necessary to carry out the provisions of this section;

(I) call conferences concerning the potential or actual contamination of indoor air giving opportunity for interested persons to be heard and present papers at such conferences;

(J) utilize, on a reimbursable basis, facilities and personnel of existing Federal scientific laboratories and research centers;

(K) acquire secret processes, technical data, inventions, patent applications, patents, licenses, and an interest in lands, plants, equipment and facilities and other property rights, by purchase, license, lease, or donation. If the Administrator expects or intends that research pursuant to this subsection will primarily affect worker safety and health, he shall consult with the Assistant Secretary of Occupational Safety and Health and the Director; and

(L) conduct research, development and demonstration activities with nonprofit institutions on the use of indoor foliage as a method to reduce indoor air pollution.

(b) PROGRAM REQUIREMENTS.—The Administrator, in coordination with other appropriate Federal agencies, shall conduct, assist, or facilitate research, investigations, studies, surveys, or demonstrations with respect to, but not limited to, the following—

(1) the effects on human health of contaminants or combinations of contaminants at various levels whether natural or anthropogenic including additive, cumulative, and synergistic effects on populations both with and without heightened sensitivity that are found or are likely to be found in indoor air;

(2) the exposure of persons to contaminants that are found in indoor air (including exposure to such substances from sources other than indoor air contamination including drinking water, diet, or other exposures);

(3) the identification of populations at increased risk of illness from exposure to indoor air contaminants and assessment of the extent and characteristics of such exposure;

(4) the exposure of persons to contaminants in different building classes or types, and in vehicles,

and assessment of the association of particular contaminants and particular building classes or types and vehicles;

(5) identification of building classes or types and design features or characteristics which increase the likelihood of exposure to indoor air contaminants;

(6) identification of the sources of indoor air contaminants including association of contaminants with outdoor sources, building or vehicle design, classes or types of products, building management practices, equipment operation practices, building materials, and related factors;

(7) assessment of relationships between contaminant concentration levels in ambient air and the contaminant concentration levels in the indoor air;

(8) development of methods and techniques for characterizing and modeling indoor air movement and flow within buildings or vehicles, including the transport and dispersion of contaminants in the indoor air;

(9) assessment of the fate, including degradation and transformation, or particular contaminants in indoor air;

(10) development of methods and techniques to characterize the association of contaminants, the levels of contaminants, and the potential for contamination of new construction with climate, building location, seasonal change, soil and geologic formations, and related factors;

(11) assessment of indoor air quality in facilities of local education agencies and buildings housing child care facilities and development of measures and techniques for control of indoor air contamination in such buildings;

(12) development of protocols, methods, techniques and instruments for sampling indoor air to determine the presence and level of contaminants including sample collection and the storage of samples before analysis and development of methods to improve the efficiency and reduce the cost of analysis;

(13) development of air quality sampling methods and instruments which are inexpensive and easy to use and may be used by the general public;

(14) development of control technologies, building design criteria, and management practices to prevent the entrance of contaminants into buildings or vehicles (for example, air intake protection, sealing, and related measures) and to reduce the con-

centrations of contaminants indoor (for example, control of emissions from internal sources of contamination, improved air exchange and ventilation, filtration, and related measures);

(15) development of materials and products which may be used as alternatives to materials or products which are now in use and which contribute to indoor air contamination;

(16) development of equipment and processes for removal of contaminants from the indoor air;

(17) research, to be carried out principally by the Occupational Safety and Health Administration and the National Institute for Occupational Safety and Health, for the purpose of assessing—

(A) the exposure of workers to indoor air contaminants including assessment of resulting health effects; and

(B) the costs of declines in productivity, sick time use, increased use of employer-paid health insurance, and worker compensation claims;

(18) research, to be carried out in conjunction with the Secretary of Housing and Urban Development, and the Secretary of the Department of Energy for the purpose of developing—

(A) methods for assessing the potential for radon contamination of new construction, including (but not limited to) consideration of the moisture content of soil, permeability of soil, and radon content of soil; and

(B) design measures to avoid indoor air pollution, and

(19) research, to be carried out in conjunction with the Secretary of Transportation, for the purposes of—

(A) assessing the potential for indoor air contamination in public and private transportation; and

(B) designing measures to avoid such indoor air contamination.

(20) research, to be carried out in consultation with the Administrator for the National Aeronautics and Space Administration, for the purpose of assessing the use of indoor foliage as a means to reduce indoor air contamination, including demonstration projects to determine the level of pollutants reduced by indoor plants in buildings.

(c) TECHNOLOGY DEMONSTRATION PROGRAM.—(1) The Administrator may enter into cooperative agreements or contracts, or provide financial assistance in the form of grants, to public agencies and authorities, nonprofit institutions and organizations, employee advocate organizations, local educational institutions, or other persons, to demonstrate practices, methods, technologies, or processes which may be effective in controlling sources or potential sources of indoor air contamination, preventing the occurrence of indoor air contamination, and reducing exposures to indoor air contamination.

(2) The Administrator may assist demonstration activities under paragraph (1) of this subsection only if—

(A) such demonstration activity will serve to demonstrate a new or significantly improved practice, method, technology or process or the feasibility and cost effectiveness of an existing, but unproven, practice, method, technology, or process and will not duplicate other Federal, State, local, or commercial efforts to demonstrate such practice, method, technology, or process;

(B) such demonstration activity meets the requirements of this section and serves the purposes of this Act;

(C) the demonstration of such practice, technology, or process will comply with all other laws and regulations for the protection of human health, welfare, and the environment; and

(D) in the case of a contract or cooperative agreement, such practice, method, technology, or process would not be adequately demonstrated by State, local, or private persons or in the case of an application for financial assistance by a grant, such practice, method, technology, or process is not likely to receive adequate financial assistance from other sources.

(3) The demonstration program established by this subsection shall include solicitations for demonstration projects, selection of suitable demonstration projects from among those proposed, supervision of such demonstration projects, evaluation and publication of the results of demonstration projects, and dissemination of information on the effectiveness and feasibility of the practices, methods, technologies and processes which are proven to be effective.

(4) Within one hundred and eighty days after the date of enactment of this title, and no less often than every twelve months thereafter, the Administrator shall publish a solicitation for proposals to demonstrate, prototype or at full-scale, practices, methods, technologies, and processes which are (or may be) effective in controlling sources or potential sources of indoor air contaminants. The solicitation notice shall prescribe the information to be included

in the proposal, including technical and economic information derived from the applicant's own research and development efforts, and other information sufficient to permit the Administrator to assess the potential effectiveness and feasibility of the practice, method, technology, or process proposed to be demonstrated.

(5) Any person and any public or private nonprofit entity may submit an application to the Administrator in response to the solicitations required by paragraph (4) of this subsection. The application shall contain a proposed demonstration plan setting forth how and when the project is to be carried out and such other information as the Administrator may require.

(6) In selecting practices, methods, technologies or processes to be demonstrated, the Administrator shall fully review the applications submitted and shall evaluate each project according to the following criteria—

(A) the potential for the proposed practice, method, technology, or process to effectively control sources or potential sources of contaminants which present risks to human health;

(B) the consistency of the proposal with the recommendations provided pursuant to paragraph (8) of section 8(d);

(C) the capability of the person or persons proposing the project to successfully complete the demonstration as described in the application;

(D) the likelihood that the demonstrated practice, method, technique, or process could be applied in other locations and circumstances to control sources or potential sources of contaminants, including considerations of cost, effectiveness, and technological feasibility;

(E) the extent of financial support from other persons to accomplish the demonstration as described in the application; and

(F) the capability of the person or persons proposing the project to disseminate the results of the demonstration or otherwise make the benefits of the practice, method, or technology widely available to the public in a timely manner.

(7) The Administrator shall select or refuse to select a project for demonstration under this subsection in an expeditious manner. In the case of a refusal to select a project, the Administrator shall notify the applicant of the reasons for the refusal.

(8) Each demonstration project under this section shall be performed by the applicant, or by a person satisfactory to the applicant, under the supervision of the Ad-

ministrator. The Administrator shall enter into a written agreement with each applicant granting the Administrator the responsibility and authority for testing procedures, quality control, monitoring, and other measurements necessary to determine and evaluate the results of the demonstration project.

(9) The Administrator shall enter into agreements, wherever practicable and desirable, to provide for monitoring testing procedures, quality control, and such other measurements necessary to evaluate the results of demonstration projects or facilities intended to control sources or potential sources of contaminants.

(10) Each demonstration project under this section shall be completed within such time as is established in the demonstration plan. The Administrator may extend any deadline established under this subsection by mutual agreement with the applicant concerned.

(11) Total Federal funds for any demonstration project under this section shall not exceed 75 per centum of the total cost of such project. In cases where the Administrator determines that research under this section is of a basic nature which would not otherwise be undertaken, or the applicant is a local educational agency, the Administrator may approve grants under this section with a

matching requirement other than that specified in this subsection, including full Federal funding.

(12) The Administrator shall, from time to time, publish general reports describing the findings of demonstration projects conducted pursuant to this section. Such reports shall be provided to the Indoor Air Quality Information Clearinghouse provided for in section 13 of this Act.

(d) ASSESSMENT OF SCHOOLS AND CHILD CARE FACILITIES.—(1) The Administrator shall conduct a national assessment of the seriousness and extent of indoor air contamination in buildings owned by local educational agencies and child care facilities.

(2) The Administrator shall establish an advisory group made up of representatives of school administrators, teachers, child care organizations, parents and service employees and other interested parties, including scientific and technical experts familiar with indoor air pollution exposures, effects, and controls, to provide guidance and direction in the development of the national assessment.

(3) The Administrator shall provide a report to Congress of the results of the national assessment not later than two years after the date of enactment of this Act. The report required by this paragraph shall provide such recommendations for activities or programs to reduce and avoid indoor air contamination in buildings owned by local

educational agencies and in child care facilities as the Administrator determines to be appropriate.

(e) REPORTS TO CONGRESS.—(1) The Administrator shall, within twenty-four months of the date of enactment of this Act, prepare and submit to the Congress a report reviewing and assessing issues related to chemical sensitivity disorders, including multiple chemical sensitivities. The Advisory Committee established pursuant to section 7(c) of this title shall review and comment on the report prior to submittal to the Congress.

(2) The Administrator, in consultation with the Administrator for the National Aeronautics and Space Administration, shall submit to the Congress a report on the research program authorized under paragraph (20) of subsection (b) within 2 years of enactment of this Act.

(f) CLARIFICATION OF AUTHORITY.—Title IV of the Superfund Amendments and Reauthorization Act of 1986 (42 U.S.C. 7401 note) is repealed.

SEC. 6. MANAGEMENT PRACTICES AND VENTILATION STANDARDS.

SEC. 6. (a) TECHNOLOGY AND MANAGEMENT PRACTICE ASSESSMENT BULLETINS.—(1) The Administrator shall publish bulletins providing an assessment of technologies and management practices for the control and measurement of contaminants in the air indoors.

(2) Bulletins published pursuant to this subsection shall, at a minimum—

(A) describe the control or measurement technology or practice;

(B) describe the effectiveness of the technology or practice in control or measurement of indoor air contaminants and, to the extent feasible, the resulting reduction in risk to human health;

(C) assess the feasibility of application of the technology or practice in buildings of different types, sizes, ages, and designs;

(D) assess the cost of application of the technology or practice in buildings of different types, sizes, ages, and designs, including capital and operational costs; and

(E) assess any risks to human health that such technology or practice may create.

(3) The Administrator shall establish and utilize a standard format for presentation of the technology and management practice assessment bulletins. The format shall be designed to facilitate assessment of technologies or practices by interested parties, including homeowners and building owners and managers.

(4) The Administrator shall provide that bulletins published pursuant to this subsection shall be published

on a schedule consistent with the publication of health advisories pursuant to section 7(b) of this Act to the extent practicable.

(5) In development of bulletins pursuant to this subsection, the Administrator shall provide for public review and shall consider public comment prior to publication of bulletins. Where the technology or management practice is expected to have significant implications for worker safety or health, the Administrator shall consult with the Director prior to seeking review and comment.

(6) Bulletins published pursuant to this subsection shall be provided to the Indoor Air Quality Information Clearinghouse provided for in section 13 of this Act and, to the extent practicable, shall be made available to architecture, design, and engineering firms and building owners and managers and to organizations representing such parties.

(b) MODEL BUILDING MANAGEMENT PRACTICES TRAINING.—(1) Within twelve months of the date of enactment of this Act, the Director of the National Institute of Occupational Safety and Health, in consultation with the Administrator of the General Services Administration and the Administrator, shall develop an indoor air training course providing training in—

(A) principles, methods, and techniques related to ventilation system operation and maintenance including applicable ventilation guidelines and standards;

(B) maintenance of records concerning indoor air quality, including maintenance of ventilation systems, complaints of indoor air quality, and actions taken to address indoor air quality problems;

(C) health threats posed by indoor air pollutants, including a knowledge of health advisories published pursuant to this title and other information concerning contaminant levels;

(D) identification of potential indoor air pollutant sources and options for reducing exposures to contaminants;

(E) special measures which may be necessary to reduce indoor air contaminant exposures in new buildings and in portions of buildings which have been renovated or substantially refurbished within the past six months; and

(F) special measures which may be necessary to reduce exposures to contaminants associated with pesticide applications, installation of products, furnishings, or equipment, and cleaning operations.

(2) Within twenty-four months of the date of enactment of this Act, the Director of the National Institute for Occupational Safety and Health shall provide, or contract for the provision of, training courses pursuant to paragraph (1) of this subsection sufficient, at a minimum, to assure training on a schedule consistent with the requirements of section 9(f)(2).

(3) The Director of the National Institute of Occupational Safety and Health, or firms or organizations operating under contract with such Administrator, are authorized to establish a fee for training pursuant to this subsection. Fees shall be in an amount not to exceed the amount necessary to defray the costs of the training program.

(4) The Director of the National Institute of Occupational Safety and Health, in consultation with the Administrator of the General Services Administration, and the Administrator, shall prepare a report to Congress within forty-eight months of the date of enactment of this subsection assessing the training program pursuant to this subsection and making recommendations concerning the application of training requirements to classes and types of buildings not covered by this subsection.

(c) VENTILATION PROGRAM.—(1) The Administrator, in coordination with other Federal agencies, shall conduct a program to analyze the adequacy of existing ventilation standards and guidelines to protect the public and workers from indoor air contaminants.

(2) The Administrator shall—

(A) identify and describe ventilation standards adopted by State and local governments and professional organizations, including the American Society of Heating, Refrigerating and Air Conditioning Engineers;

(B) determine the adequacy of the standards for protecting public health and promoting worker productivity;

(C) assess the costs of compliance with such standards;

(D) determine the degree to which such standards are being adopted and enforced;

(E) identify the extent to which buildings are being operated in a manner which achieves the standards; and

(F) assess the potential for such standards to complement controls over specific sources of contaminants in reducing indoor air contamination.

(3) The Administrator shall submit to the Congress, within thirty-six months of the enactment of this Act a report which shall—

(A) describe the ventilation program carried out under this Act; and

(B) make recommendations concerning—

(i) the establishment of ventilation standards which protect public and worker health and take comfort and energy conservation goals into account; and

(ii) ensuring that adequate ventilation standards are being adopted and that buildings are being operated in a manner which achieves the standards.

SEC. 7. INDOOR AIR CONTAMINANT HEALTH ADVISORIES.

(a) LIST OF CONTAMINANTS.—(1) Within two hundred and forty days after the date of enactment of this Act, the Administrator shall prepare and publish in the Federal Register a list of the contaminants (hereinafter referred to as listed contaminants) that may occur or are known to occur in indoor air at levels which may reasonably be expected to have an adverse impact on human health. The list may include combinations or mixtures of contaminants and may refer to such combinations or mixtures by a common name.

(2) The Administrator shall from time to time and as necessary to carry out the provisions of this Act, but not less often than biennially, review and revise such list

adding other contaminants pursuant to the requirements of this Act.

(3) The list provided for in paragraph (1) of this subsection shall include, at a minimum: benzene, biological contaminants, carbon monoxide, formaldehyde, lead, methylene chloride, nitrogen oxide, particulate matter, asbestos, polycyclic aromatic hydrocarbons, (PAHs), and radon.

(4) In development of the list provided for in paragraph (1) of this subsection or in revision of such list pursuant to paragraph (2), the Administrator shall consult with the advisory panel provided for in subsection (c) of this section and provide for public review and shall consider public comment prior to issuance of a final list.

(5) The listing of contaminants under this subsection is not an agency rulemaking. In considering objections raised in any judicial or related action, the Administrator's decision to list a particular contaminant shall be upheld unless the objecting party can demonstrate that the decision was arbitrary or capricious or otherwise not in accordance with the law. The list of contaminants prepared in accordance with this subsection shall not be construed to indicate that those contaminants not listed are safe for human exposure or without adverse health effect.

(6) Upon application of the Governor of a State showing that a contaminant or potential contaminant in the indoor air which is not listed pursuant to paragraph (1) of this subsection may reasonably be anticipated to have an adverse effect on human health as a result of its presence in the indoor air, the Administrator shall, within ninety days, revise the list established by paragraph (1) of this subsection to include such contaminant or publish in the Federal Register the reasons for not making such a revision.

(b) CONTAMINANT HEALTH ADVISORIES.—(1) The Administrator shall, in consultation with the advisory panel, provided for in subsection (c) of this section, and after providing for public review and comment pursuant to paragraph (6), publish advisory materials addressing the adverse human health effects of listed contaminants.

(2) Such advisory materials shall, at a minimum, describe—

(A) the physical, chemical, biological, and radiological properties of the contaminant;

(B) the adverse human health effects of the contaminant in various indoor environments and in various concentrations;

(C) and analysis of the risk posed by the contaminant to human health at the full range of concentration levels, including risk to subpopulations which may be especially sensitive to exposure to the contaminant;

(D) the extent to which the contaminant, or a mixture of contaminants, is associated with a particular substance of material and emissions rates which are expected to result in varying levels of contaminant concentration in indoor air;

(E) any Technology and Management Practice Assessment Bulletin which is applicable to the contaminant and any actions which are identified for the contaminant in the National Indoor Air Quality Response Plan prepared pursuant to this Act; and

(F) any indoor air contaminant standards or related action levels which are in effect under any authority of a Federal statute or regulation, the authority of State statutes or regulations, the authority of any local government, or the authority of another country, including standards or action levels suggested by appropriate international organizations.

(2) Health advisories published pursuant to his section shall in no way limit or restrict the application of requirements or standards established under any other Federal statute.

(3) The Administrator shall establish and utilize a standard format of presentation of indoor air contaminant health advisories. The format shall be designed to facilitate public understanding of the range of risks of exposure to indoor air contaminants and shall include a summary of the research and information concerning the contaminant which is understandable to public health professionals and to those who lack training in toxicology.

(4) The Administrator shall publish health advisories for listed contaminants as expeditiously as possible. At a minimum, the Administrator shall publish not less than six advisories within eighteen months of the date of enactment of this Act and shall publish an additional six advisories within thirty-six months of the date of enactment of this Act

(5) Health advisories shall be based on the most current available scientific and related findings or information and shall be reviewed, revised, and republished to reflect new scientific and related findings or information on a periodic basis but not less frequently than every five years.

(6) In development and revision of health advisories pursuant to this subsection, the Administrator shall provide for public review and comment, including provision of notice in the Federal Register of the intent to publish

a health advisory not less than ninety days prior to publication, and shall consider public comment prior to issuance of an advisory.

(c) ADVISORY PANEL.—The Indoor Air Quality and Total Human Exposure Committee of the Environmental Protection Agency Science Advisory Board shall advise the Administrator with respect to the implementation of this section including, but not limited to, the listing of contaminants, the contaminants for which advisories should be published, the order in which advisories should be published, the content, quality, and format of advisory documents, and the revision of such documents. The Administrator shall provide that a representative of the Agency for Toxic Substances and Disease Registry, the Department of Energy Office of Health and Environmental Research, the National Institute for Occupational Safety and Health, and the National Institute for Environmental Health Sciences shall participate in the work of the Advisory Panel as ex officio members.

SEC. 8. NATIONAL INDOOR AIR QUALITY RESPONSE PLAN.

(a) AUTHORITY.—(1) The Administrator shall, in coordination with other appropriate Federal agencies, develop and publish a national indoor air quality response plan.

(2) The response plan shall provide for implementation of a range of response actions identified in subsections (b) and (c) which will result in the reduction of human exposure to indoor air contaminants listed pursuant to section 7(a) of this Act and attainment, to the fullest extent practicable, of indoor air contaminant levels which are protective of human health.

(b) EXISTING AUTHORITY.—The Administrator, in coordination with other appropriate Federal agencies, shall include in the plans provided for in subsection (a) of this section a description of specific response actions to be implemented based on existing statutory authorities provided in—

(1) the Clean Air Act (42 U.S.C. 7401 et seq.);

(2) the Toxic Substances Control Act (15 U.S.C. 201 et seq.);

(3) the Federal Insecticide, Fungicide, and Rodenticide Act (7 U.S.C. 136 et seq.);

(4) the Safe Drinking Water Act (42 U.S.C. 300 et seq.);

(5) the authorities of the Consumer Product Safety Commission;

(6) the authorities of the Occupational Safety and Health Administration and the National Institute for Occupational Safety and Health; and

(7) other regulatory and related authorities provided under any other Federal statute.

In implementation of response actions pursuant to paragraph (6) of this subsection the Assistant Secretary for Occupational Safety and Health shall consult with representatives of State and local governments and their employees with respect to States where the Occupational Safety and Health Administration lacks jurisdiction over State and local employees.

(c) SUPPORTING ACTINGS.—The Administrator, in coordination with other appropriate Federal agencies, shall include in the plans provided for in subsection (a) of this section a description of specific supporting actions including, but not limited to—

(1) programs to disseminate technical information to public health, design, and construction professionals concerning the risks of exposure to indoor air contaminants and methods and programs for reducing exposures to such contaminants;

(2) development of guidance documents addressing individual contaminants, groups of contaminants, sources of contaminants, or types of buildings or structures and providing information on measures to reduce exposure to contaminants including—

(A) the estimated cost of such measures;

(B) the technologic feasibility of such measures; and

(C) the effectiveness and efficiency of such measures.

(3) education programs for the general public concerning the health threats posed by indoor air contaminants and appropriate individual response actions;

(4) technical assistance including design and implementation of training seminars for State and local officials, private and professional firms, and labor organizations dealing with indoor air pollution and addressing topics such as monitoring, analysis, mitigation, building management practices, ventilation, health effects, public information and program design;

(5) development of model building codes, including ventilation rates, for various types of buildings designed to reduce levels of indoor air contaminants;

(6) identification of contaminants, or circumstances of contamination for which immediate action to protect public and worker health is necessary and appropriate and a description of the actions needed;

(7) identification of contaminants, or circumstances of contamination, where regulatory or statutory authority is not adequate to address an identified contaminant or circumstance of contamination and recommendation of legislation to provide needed authority;

(8) identification of contaminants, or circumstances of contamination, where continued reduction of contamination requires development of technology or technological mechanisms; and

(9) identification of remedies to "sick building syndrome", including proper design and maintenance of ventilation systems, building construction and remodeling practices, and safe practices for the application of pesticides, herbicides, and disinfectants, and a standardized protocol for investigating and solving indoor air quality problems in sick buildings.

(d) CONTENTS OF PLAN.—In describing specific actions to be taken under subsections (b) and (c) of this section, the Administrator, in coordination with other appropriate Federal agencies, shall—

(1) identify the health effects, and any contaminant or contaminants thought to cause health effects to be addressed by a particular action and to the

fullest extent feasible, the relative contribution to indoor air contamination from all sources of contamination;

(2) identify the statutory basis for the action;

(3) identify the schedule and process for implementation of the action;

(4) identify the Federal agency with jurisdiction for the specific action which will implement the action; and

(5) identify the financial resources needed to implement the specific action and the source of these resources.

(e) SCHEDULE.—Response plans provided for in subsection (a) shall be submitted to Congress within twenty-four months of enactment of this title and biennially thereafter.

(f) REVIEW.—(1) The Administrator shall provide for public review and comment on the response plan provided for in this section, including provision of notice in the Federal Register for public review and comment not less than three months prior to submission to the Congress. The Administrator shall include in the response plan a summary of public comments.

(2) The Administrator shall provide for the review and comment on the response plan by the Council on Indoor Air Quality provided for under section 12 of this Act.

(g) ASSESSMENT OF MONITORING AND MITIGATION SERVICES.—The Administrator shall include in the first plan published pursuant to this section an assessment of indoor air monitoring and mitigation services provided by private firms and other organizations, including the range of such services, the reliability and accuracy of such services, and the relative costs of such services. The assessment required by this subsection shall include a review and analysis of options for oversight of indoor air monitoring and mitigation firms and organizations, including registration, licensing, and certification of such firms and organizations and options for imposing a user fee on such firms and organizations.

SEC. 9. FEDERAL BUILDING RESPONSE PLAN AND DEMONSTRATION PROGRAM.

(a) AUTHORITY.—The Administrator and the Administrator of the General Services Administration shall develop and implement a program to respond to and reduce indoor air contamination in Federal buildings and to demonstrate methods of reducing indoor air contamination in new Federal buildings.

(b) FEDERAL BUILDING RESPONSE PLAN.—(1) The Administrator of the General Services Administration, in consultation with the Administrator, the Assistant Secretary for Occupational Safety and Health Administration, the Director, and affected Federal departments or agencies shall prepare response plans addressing indoor air quality in Federal buildings. The plans shall, to the fullest extent practicable, be developed in conjunction with response plans pursuant to section 8 of this Act.

(2) The response plan shall provide for implementation of a range of response actions which will result in the reduction of human exposure to indoor air contaminants listed pursuant to section 7(a) of this Act, and attainment, to the fullest extent practicable, of indoor air contaminant concentration levels which are protective of public and worker health.

(3) Federal building response plans provided for in paragraph (1) of this subsection shall include—

(A) a list of all Federal buildings;

(B) a description and schedule of general response actions including general building management practices, product purchase guidelines, air quality problem identification practices and methods, personnel training programs, and other actions to be implemented to reduce exposures to indoor air contaminants in those buildings listed in subparagraph (A);

(C) a list of individual Federal buildings listed in subparagraph (A) for which there is sufficient evidence of indoor air contamination or related employee health effects to warrant assessment of the building pursuant to section 14 of this Act and a schedule for development and submittal of building assessment proposals pursuant to section 14(d) of this Act;

(D) a description and schedule of specific response actions to be implemented in each specific building identified in subparagraph (C) and assessed pursuant to section 14 of this Act;

(E) an identification of the Federal agency responsible for funding and implementation of each response action identified in subparagraphs (B) and (D); and

(F) an identification of the estimated costs of each response action identified in subparagraphs (B) and (D) and the source of these resources.

(4) The response plan provided for in this subsection shall address each Federal building identified in paragraph (3)(a), except that specific buildings may be ex-

empted from coverage under this subsection. Such buildings may be exempted on the grounds of—

(A) national security;

(B) anticipated demolition or termination of Federal ownership within three years; and

(C) specialized use of a building which precludes necessary actions to reduce indoor air contamination.

(5) The plan provided for in subsection (b) shall be submitted to Congress within twenty-four months of enactment of this title and biennially thereafter.

(6) The Administrator of the General Services Administration shall provide for public review and comment on the response plan provided for in this section, including provision of notice in the Federal Register not less than three months prior to submission to the Congress.

(7) The response plan shall include a summary of public comments. The Council on Indoor Air Quality, provided for under section 12 of this Act, shall review and comment on the plan.

(c) INDOOR AIR QUALITY RESERVE.—(1) The Administrator of the General Services Administration shall reserve 0.5 per centum of any funds used for construction of new Federal buildings for design and construction of measures to reduce indoor air contaminant concentrations within such buildings.

(2) Measures which may be funded with the reserve provided for in this subsection may include, but are not limited to—

(A) development and implementation of general design principles intended to avoid or prevent contamination of indoor air;

(B) design and construction of improved ventilation techniques or equipment;

(C) development and implementation of product purchasing guidelines;

(D) design and construction of contaminant detection and response systems;

(E) development of building management guidelines and practices; and

(F) training in building and systems operations for building management and maintenance personnel.

(3) Upon completion of construction of each Federal building covered by this section, the Administrator of the General Services Administration shall file with the Administrator, with the Clearinghouse established under section 13 of this Act, and with the Council established under section 12 of this Act, a report describing the uses made of

the reserve provided for in this subsection. Such report shall be in sufficient detail to provide design and construction professionals with models and general plans of various indoor air contaminant reduction measures adequate to assess the appropriateness of such measures for application in other buildings.

(4) The Administrator of the General Services Administration, with the concurrence of the Administrator, may exempt a planned Federal building from the requirements of this subsection if he finds that such exemption is required on the grounds of national security or that the intended use of the building is not compatible with the authority of this section.

(d) NEW EPA BUILDINGS.—Any new building constructed for use by the Environmental Protection Agency as headquarters shall be designed, constructed, maintained, and operated as a model to demonstrate principles and practices for protection of indoor air quality.

(e) BUILDING COMMENTS.—(1) The Administrator of the General Services Administration, in consultation with the Administrator, the Assistant Secretary for Occupational Safety and Health Administration, and the Director, shall provide, by regulation, a method and format for filing and responding to comments and complaints concerning indoor air quality in Federal buildings by workers in such buildings and by the public. The procedure for filing and responding to worker complaints shall supplement and not diminish or supplant existing practices or procedures established under the Occupational Safety and Health Act and executive orders pertaining to health and safety for Federal employees.

(2) A listing of each such filing and an analysis of such filings shall be included in each response plan prepared pursuant to this section. Such listing shall preserve the confidentiality of individuals making filings under this section. Such listing shall preserve the confidentiality of the individuals making filings under this section.

(3) Regulations implementing this subsection shall be promulgated at the earliest possible date, but not later than twenty-four months from the date of enactment of this title.

(f) BUILDING VENTILATION AND MANAGEMENT TRAINING.—(1) Within six months of the date of enactment of this title the Administrator of the General Services Administration shall designate, or require that a lessee designate, an Indoor Air Quality Coordinator for each Federal building which is owned or leased by the General Services Administration. An Indoor Air Quality Coordinator shall not serve more than one building.

(2) Within forty-eight months of the date of enactment of this title, each Indoor Air Quality Coordinator shall complete the indoor air training course operated pursuant to section 6(b) of this Act. After thirty-six months from the date of enactment of this title, each newly designated Indoor Air Quality Coordinator shall complete the indoor air training course within twelve months of designation.

(3) In any case where the Administrator of the General Services Administration finds that a lessee has failed to designate and train an Indoor Air Quality Coordinator pursuant to the requirements of this Act, the Administrator of the General Services Administration shall not reestablish a lease for such building.

SEC. 10. STATE AND LOCAL INDOOR AIR QUALITY PROGRAMS.

(a) MANAGEMENT AND ASSESSMENT STRATEGY DEMONSTRATION.—(1) The Governor of a State may apply to the Administrator for a grant to support demonstration of the development and implementation of a management strategy and assessment with respect to indoor air quality within such State.

(2) State indoor air quality management strategies shall—

(A) identify a lead agency and provide an institutional framework for protection of indoor air quality;

(B) identify and describe existing programs, controls or related activities concerning indoor air quality within State agencies including regulations, educational programs, assessment programs, or other activities;

(C) identify and describe existing programs, controls, or related activities concerning indoor air quality of local and other sub-State agencies and assure coordination among local, State, and Federal agencies involved in indoor air quality activities in the State; and

(D) assure coordination of indoor air quality programs with ambient air quality programs and related activities.

(3) State indoor air quality assessment programs shall—

(A) identify indoor air contaminants of concern and, to the extent practicable, assess the seriousness and the extent of indoor air contamination by contaminants listed in section 7(a) of this Act;

(B) identify the classes or types of buildings or other indoor environments in which indoor air contaminants pose the most serious threat to human health;

(C) if applicable, identify geographic areas in the State where there is a reasonable likelihood of indoor air contamination as a result of the presence of contaminants in the ambient air or the existence of sources of a contaminant;

(D) identify methods and procedures for indoor air contaminant assessment and monitoring;

(E) provide for periodic assessments of indoor air quality and identification of indoor air quality changes and trends; and

(F) establish methods to provide information concerning indoor air contamination to the public and to educate the public and interested groups, including building owners and design and engineering professionals, about indoor air contamination.

(4) As part of a management strategy and assessment pursuant to this subsection, the applicant may develop contaminant action levels, guidance, or standards and may draw on health advisories developed pursuant to section 7 of this Act.

(5) States which are selected to demonstrate the development of management and assessment strategies shall provide a management strategy and assessment pursuant

to paragraphs (2) and (3) to the Administrator within thirty-six months of selection and shall certify to the Administrator that the strategy and assessment meet the requirements of this Act.

(6) States shall provide for public review and comment on the management strategy and assessment prior to submission of such strategy and assessment to the Administrator.

(b) RESPONSE PROGRAMS.—(1) A Governor of a State or the executive officer of a local air pollution control agency may apply to the Administrator for grant assistance to develop a response program designed to reduce human exposure to an indoor air contaminant or contaminants in the State, or in a specific class or type of building in that State, or in a specific geographic area of that State.

(2) A response program shall—

(A) address a contaminant or contaminants listed pursuant to section 7(a) of this Act;

(B) identify existing data and information concerning the contaminant or contaminants to be addressed, the class or type of building to be addressed, and the specific geographic area to be addressed;

(C) describe and schedule the specific actions to be taken to reduce human exposure to the identified contaminant or contaminants including the adoption and enforcement of any ventilation standards;

(D) identify the State or local agency or public organization which will implement the response actions;

(E) identify the Federal, State, and local financial resources to be used to implement the response program; and

(F) provide for the assessment of the effectiveness of the response program.

(3) As part of a response program pursuant to this subsection, an applicant may develop contaminant action levels, guidance, or standards based on health advisories developed pursuant to section 7 of this Act.

(4) As part of a response program pursuant to this subsection, an applicant may develop a standard establishing a ventilation rate or rates for a class or classes of buildings including development assessment and compliance programs needed to implement the standard.

(5) As part of the response program pursuant to this subsection, an applicant may develop a response plan addressing indoor air quality in State and local government buildings. Such plans shall, to the fullest extent prac-

ticable, be consistent with response plans developed pursuant to section 9 of this Act.

(c) GRANT MANAGEMENT.—(1) Grants under subsection (a)(1) of this subsection shall not be less than $75,000 for each fiscal year.

(2) In selecting States for demonstration and implementation of management strategies and assessments under subsection (a)(1) the Administrator shall consider—

(A) the previous experience of the State in addressing indoor air quality issues;

(B) the seriousness of the indoor air quality issues identified by the State; and

(C) the potential for demonstration of innovative management or assessment measures which may be of use to other States.

(3) In selecting States for demonstration of management strategies and assessments under subsection (a)(1), the Administrator shall focus resources to assure that sufficient funds are available to selected States to provide for the development of comprehensive and thorough management strategies and assessments in each selected State and to adequately demonstrate implementation of such strategies and assessments.

(4) Grants under subsection (b)(1) of this section shall not exceed $250,000 per fiscal year and shall be available to the State for a period of not to exceed three years.

(5) In selecting response programs developed under subsection (b) for grant assistance, the Administrator shall consider—

(A) the potential for the response program to bring about reductions in indoor air contaminant levels;

(B) the contaminants to be addressed, giving priority to contaminants for which health advisories have been developed pursuant to section 207 of this title;

(C) the type of building to be addressed, giving priority to building types in which substantial human exposures to indoor air contaminants occur;

(D) the potential for development of innovative response measures or methods which may be of use to other States or local air pollution control agencies; and

(E) the State indoor air quality management strategy and assessment, giving priority to States with complete indoor air management strategies and assessments.

(6) The Federal share of grants under subsections (a) and (b) of this section shall not exceed 75 per centum of the costs incurred in demonstration and implementation of such activities and shall be made on the condition that the non-Federal share is provided from non-Federal funds.

(7) Funds granted pursuant to subsections (a) and (b) of this section in a fiscal year shall remain available for obligation for the next fiscal year in which obligated and for the next following fiscal year.

(8) No grant shall be made under this section in any fiscal year to a State or local air pollution control agency which in the preceding year received a grant under this section unless the Administrator determines that such agency satisfactorily implemented such grant activities in such preceding fiscal year.

(9) States and air pollution control agencies shall provide such information in applications for grant assistance and pertaining to grant funded activities as the Administrator requires.

SEC. 11. OFFICE OF INDOOR AIR QUALITY.

(a) ESTABLISHMENT.—The Administrator shall establish an Office of Indoor Air Quality within the Office of Air and Radiation at the Environmental Protection Agency.

(b) RESPONSIBILITIES.—The Office of Indoor Air Quality shall—

(1) list indoor air contaminants and develop health advisories pursuant to section 7 of this Act;

(2) develop national indoor air quality response plans as provided for in section 8 of this Act;

(3) manage Federal grant assistance provided to air pollution control agencies under section 10 of this Act;

(4) assure the coordination of Federal statutes and programs administered by the Agency relating to indoor air quality and reduce duplication or inconsistencies among these programs;

(5) work with other Federal agencies, including the Occupational Safety and Health Administration and the National Institute for Occupational Safety and Health, to assure the effective coordination of programs related to indoor air quality; and

(6) work with public interest groups, labor organizations, and the private sector in development of information related to indoor air quality including the health threats of human exposure to indoor air contaminants, the development of technologies and methods to control such contaminants, and the de-

velopment of programs to reduce contaminant concentrations.

SEC. 12. COUNCIL ON INDOOR AIR QUALITY.

(a) AUTHORITY.—There is established a Council on Indoor Air Quality.

(b) RESPONSIBILITIES.—The Council on Indoor Air Quality shall—

(1) provide for the full and effective coordination of Federal agency activities relating to indoor air quality;

(2) provide a forum for resolution of conflicts or inconsistencies in policies or programs related to indoor air quality;

(3) review and comment on the national indoor air response program developed pursuant to section 208 of this title and the Federal Building Response Plan developed pursuant to section 9(b); and

(4) prepare a report to Congress pursuant to subsection (d) of this subsection.

(c) ORGANIZATION.—(1) The Council on Indoor Air Quality shall include senior representatives of Federal agencies involved in indoor air quality programs including—

(A) the Environmental Protection Agency;

(B) the Occupational Safety and Health Administration;

(C) the National Institute of Occupational Safety and Health;

(D) the Department of Health and Human Services;

(E) the Department of Housing and Urban Development;

(F) the Department of Energy;

(G) the Department of Transportation;

(H) the Consumer Product Safety Commission; and

(I) the General Services Administration.

(2) The representative of the Environmental Protection Agency shall chair the Council in the two years following enactment of this Act. In each subsequent year, members of the Council shall select the chair for that year.

(3) The Council shall be served by a staff to include an Executive Director and not less than three full-time equivalent employees.

(d) REPORT TO CONGRESS.—(1) The Council shall submit to the Congress, within eighteen months of enactment of this title, and biennially thereafter, a report which shall—

(A) describe and assess the seriousness, extent, and characteristics of indoor air contamination throughout the country;

(B) summarize the major research issues concerning the protection of indoor air quality, describe the research accomplishments of Federal agencies over the previous two years, and provide an agenda of indoor air quality research for individual Federal agencies over a three-year period;

(C) summarize actions taken pursuant to this title over the previous year, including publication of health advisories, implementation of national and Federal building response plans, and assistance to States;

(D) provide a general description of the activities to be conducted by Federal agencies to address indoor air quality problems over the following three-year period; and

(E) make recommendations for any actions needed to assure the quality of indoor air, including recommendations relating to institutional structures, funding, and legislation.

(2) The Council shall provide for public review and comment on the report required by this subsection.

SEC. 13. INDOOR AIR QUALITY INFORMATION CLEARINGHOUSE.

(1) The Administrator is authorized and directed to establish a national indoor air quality clearinghouse to be used to disseminate indoor air quality information to other Federal agencies, State, and local governments, and private organizations and individuals.

(2) The clearinghouse shall be a repository for reliable indoor air quality related information to be collected from and made available to government agencies and private organizations and individuals. At a minimum, the clearinghouse established by this section shall make available reports, programs, and materials developed pursuant to the requirements of this Act.

(3) The clearinghouse shall operate a toll-free "hotline" on indoor air quality which shall be available to provide to the public general information about indoor air quality and general guidance concerning response to indoor air quality contamination problems.

(4) The Administrator may provide for the design, development, and implementation of the clearinghouse through a contractual agreement with a nonprofit organization.

SEC. 14. BUILDING ASSESSMENT DEMONSTRATION.

(a) AUTHORITY.—(1) The Director of the National Institute for Occupational Safety and Health shall, in consultation with the Administrator, implement a Building Assessment Demonstration Program to support development of methods, techniques, and protocols for assessment of indoor air contamination in nonresidential, nonindustrial buildings and to provide assistance and guidance to building owners and occupants on measures to reduce indoor air contamination.

(2) In implementation of this section, the Director shall have the authority to conduct on-site assessments of individual buildings, including Federal, State, and municipal buildings.

(3) Nothing in this section shall in any way limit or constrain existing authorities pursuant to the Occupational Safety and Health Act of 1970 (29 U.S.C. 651).

(b) ASSESSMENT ELEMENTS.—Assessments of individuals buildings conducted pursuant to this section shall, at a minimum, provide—

(1) an identification of suspected contaminants in the air in the building and the level of such contaminants;

(2) an assessment of the probable sources of contaminants in the air in the building;

(3) a review of the nature and extent of health concerns and symptoms identified by building occupants;

(4) an assessment of the probable association of indoor air contaminants with the health and related concerns of building occupants including assessment of occupational and environmental factors which may relate to the health concerns;

(5) identification of appropriate measures to control contaminants in the air in the building, to reduce the concentration levels of contaminants, and to reduce exposure to contaminants; and

(6) evaluation of the effectiveness of response measures in control and reduction of contaminants and contaminant levels, the change in occupant health concerns and symptoms, the approximate costs of such measures, and any additional response measures which may reduce occupant's health concerns.

(c) ASSESSMENT REPORTS.—(1) The Director shall prepare—

(A) a preliminary report of each building assessment which shall document findings concerning assessment elements in paragraphs (1) through (5) of subsection (b); and

(B) a final report which shall provide an overall summary of the building assessment including information on the effectiveness and cost of response measures, and the potential for application of response measures to other buildings.

(2) Preliminary assessment reports shall be prepared not later than one hundred and eighty days after the selection of a building for assessment. Final assessment reports shall be prepared not later than one hundred and eighty days after completion of the preliminary report.

(3) Preliminary and final reports shall be made available to building owners, occupants, and the authorized representatives of occupants.

(d) BUILDING ASSESSMENT PROPOSAL.—(1) The Director shall consider individual buildings for assessment under this section in response to a proposal identifying the building and the building owner and providing preliminary, background information about the nature of the indoor air contamination, previous response to air contamination problems, and the characteristics, occupancy, and uses of the building.

(2) Building assessment proposals may be submitted by a building owner or occupants or the authorized representatives of building occupants, including the authorized representatives of employees working in a building.

(e) BUILDING ASSESSMENT SELECTION.—(1) In selection of buildings to be assessed under this section the Director shall consider—

(A) the seriousness and extent of apparent indoor air contamination and human health effects of such contamination;

(B) the proposal for a building assessment submitted pursuant to subsection (d) of this section;

(C) the views and comments of the building owners;

(D) the potential for the building assessment to expand knowledge of building assessment methods including identification of contaminants, assessment of sources, and development of response measures; and

(E) the listing of a building pursuant to subparagraph (C) of section 9(b)(3).

(2) The Director shall provide a preliminary response and review of building assessment proposals to applicants and the applicable building owner within sixty days of receipt of a proposal and, to the extent practicable, shall provide a final decision concerning selection of a proposal within one hundred and twenty days of submittal.

(f) BUILDING ASSESSMENT SUPPORT.—(1) The Director may enter into agreements with private individuals, firms, State and local governments, or academic institutions for services and related assistance in conduct of assessments under the authority of this section.

(2) The Director may enter into agreements with other Federal agencies for the assignment of Federal employees to a specific building assessment project for periods of up to one hundred and eighty days.

(g) SUMMARY REPORT.—(1) The Director shall provide, on an annual basis, a report on the implementation of this section to the Administrator of the Environmental Protection Agency and to the Council on Indoor Air Quality established pursuant to section 12 of this Act.

(2) The Director shall, from time to time and in consultation with the Administrator, publish general reports containing materials, information, and general conclusions concerning assessments conducted pursuant to this section. Such reports may address concerns related to remediation of indoor air contamination problems, assessment of health related concerns, and prevention of such problems through improved design, materials and product specifications, and management practices.

(3) Reports prepared pursuant to this subsection and subsection (c) of this section shall be provided to the Indoor Air Quality Information Clearinghouse provided for in section 13 of this Act and, to the extent practicable, such reports shall be made available to architectural, design and engineering firms and to organizations representing such firms.

SEC. 15. STATE AND FEDERAL AUTHORITY.

(a) GENERAL AUTHORITY.—Nothing in this title shall be construed, interpreted, or applied to preempt, displace, or supplant any other State or Federal law, whether statutory or common or any local ordinance.

(b) OCCUPATIONAL SAFETY AND HEALTH.—In exercising any authority under this title, the Administrator shall not, for purposes of section 4(b)(1) of the Occupational Safety and Health Act of 1970 (29 U.S.C. 653(b)(1)), be deemed to be exercising statutory authority to prescribe or enforce standards or regulations affecting occupational safety and health.

SEC. 16. AUTHORIZATIONS.

(a) For the purpose of carrying out sections 5, 6, and 7 of this Act there is authorized to be appropriated $20,000,000 for each of the fiscal years ending September 30, 1994, 1995, 1996, 1997, and 1998. Of such sums appropriated, one quarter shall be reserved for implementation of section 7 of this Act and one quarter shall be reserved for implementation of section 5(c) of this Act and $1,000,000 shall be reserved for implementation of section 6(b) of this Act.

(b) For the purpose of carrying out section 8, 9, 11, and 13 of this Act there is authorized to be appropriated $10,000,000 for each of the fiscal years ending September 30, 1994, 1995, 1996, and 1997, and 1998. Of such sums appropriated, one-fifth shall be reserved for implementation of section 13 and one-fifth shall be reserved for implementation of section 9.

(c) For the purpose of carrying out section 10 of this Act, there is authorized to be appropriated $12,000,000 for each of the fiscal years ending September 30, 1994, 1995, 1996, 1997, and 1998. Of such sums appropriated, one-third shall be reserved for the purpose of carrying out section 10(b) of this Act.

(d) For the purpose of carrying out section 12 of this Act there is authorized to be appropriated $1,500,000 for each fiscal year ending September 30, 1994, 1995, 1996, 1997, and 1998.

(e) For the purpose of carrying out section 14 of this Act there is authorized to be appropriated $5,000,000 for each of the fiscal years ending September 30, 1994, 1995, 1996, 1997, and 1998.

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II

103D CONGRESS
1ST SESSION

S. 657

To reauthorize the Indoor Radon Abatement Act of 1988, and for other purposes.

IN THE SENATE OF THE UNITED STATES

MARCH 25 (legislative day, MARCH 3), 1993

Mr. LAUTENBERG (for himself, Mr. CHAFEE, Mr. MITCHELL, Mr. LIEBERMAN, Mr. WOFFORD, Mr. BRADLEY, Mr. MOYNIHAN, and Mr. PELL) introduced the following bill; which was read twice and referred to the Committee on Environment and Public Works

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A BILL

To reauthorize the Indoor Radon Abatement Act of 1988, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

SECTION 1. SHORT TITLE.

This Act may be cited as the "Indoor Radon Abatement Reauthorization Act of 1993".

SEC. 2. NATIONAL GOALS.

Section 301 of the Toxic Substances Control Act (15 U.S.C. 2661) is amended—

(1) in the heading, by striking "NATIONAL GOAL" and inserting "NATIONAL GOALS";

(2) by inserting "(a) RADON LEVELS.—" before the first sentence of the section; and

(3) by adding at the end the following new subsections:

"(b) TESTING.—It is the goal of the United States that all homes, schools, and Federal buildings be tested for radon.

"(c) TARGET ACTION POINT.—

"(1) IN GENERAL.—Not later than 120 days after the date of enactment of this subsection, the Administrator shall establish a target action point indicating a level of indoor radon that the Administrator determines to be as close to the national ambient outdoor radon level as can be achieved consistently in single-family homes in existence at the time of the determination through the application of readily available and generally affordable radon mitigation practices and technologies.

"(2) REVIEW.—The Administrator shall review the target action point periodically, but not less often than every 5 years, and revise the target action point as necessary.".

SEC. 3. DEFINITIONS.

Section 302 of the Toxic Substances Control Act (15 U.S.C. 2662) is amended by adding at the end the following new paragraphs:

"(5) The term 'Administrator' means the Administrator of the Environmental Protection Agency.

"(6) The term 'contract for the purchase and sale of residential real property' means any contract or agreement whereby 1 party agrees to purchase from another party any interest in real property on which there is situated 1 or more residential dwelling units used or occupied, or intended to be used or occupied, wholly or partly, as the home or residence of 1 or more persons.

"(7) The term 'direct Federal financial assistance' means assistance in financing a residential dwelling provided by the Federal Housing Administration, Farmers Home Administration, and the Department of Veterans Affairs.

"(8) The term 'Federal building' means any building that is used primarily as an office building, school, hospital, or residence that is—

"(A) owned, leased, or operated by a Federal agency, "(B) occupied by the Library of Congress, is part of the White House, or is the residence of the Vice President, or

"(C) included in the definition of 'Capitol Buildings' under section 16(a) of the Act entitled 'An Act to define the area of the United States Capitol Grounds, to regulate the use thereof, and for other purposes', approved July 31, 1946 (40 U.S.C. 193m(1)).

"(9) The term 'federally owned housing' means any residential dwelling or multiunit residential structures owned or managed by a Federal agency or for which a Federal agency is a trustee or conservator. For the purpose of this paragraph, the term 'Federal agency' includes the Resolution Trust Corporation and the Federal Deposit Insurance Corporation.

"(10) The term 'multiunit residential structure' means a building containing more than 4 separate residential dwelling units, each such unit used or occupied, or intended to be used or occupied, wholly or partly, as the home or residence of 1 or more persons.

"(11) The term 'person' means an individual, trust, firm, joint stock company, corporation (including a government corporation), partnership, association, State, municipality, commission, political subdivision of a State, or an interstate body.

"(12) The term 'residential dwelling' means—

"(A) a single-family dwelling or a one-family dwelling unit in a structure containing not more than four separate residential dwelling units, each such unit used or occupied, or intended to be used or occupied, wholly or partly, as the home or residence of one or more persons; or

"(B) a single-family or one-family dwelling unit on the subground, ground, or first-floor-above-ground level of a multiunit residential structure.".

SEC. 4. PRIORITY RADON AREAS.

Title III of the Toxic Substances Control Act (15 U.S.C. 2661 et seq.) is amended—

(1) by redesignating sections 303 through 311 (15 U.S.C. 2663 through 2671) as sections 304 through 312, respectively; and

(2) by inserting after section 302 the following new section:

"SEC. 303. PRIORITY RADON AREAS.

"(a) DESIGNATION OF AREAS.—The Administrator shall, as expeditiously as possible, but not later than October 1, 1993, designate areas as priority radon areas, and revise the designations, as appropriate thereafter.

"(b) STANDARD FOR DESIGNATION.—The Administrator shall designate an area as a priority radon area in any case in which the Administrator determines that there is a reasonable likelihood that the average indoor radon level in the area is likely to exceed the national average indoor radon level by more than a de minimis amount.

"(c) FACTORS.—In designating priority radon areas, the Administrator shall consider the most current available information at the time of the designation, including—

"(1) the national assessment of radon conducted pursuant to section 118(k) of the Superfund Amendments and Reauthorization Act of 1986 (42 U.S.C. 7401 note);

"(2) surveys of school buildings conducted pursuant to section 308;

"(3) surveys of Federal buildings conducted pursuant to section 310;

"(4) surveys of work places conducted pursuant to section 318; and

"(5) any other information, including other radon measurements and geological data, that the Administrator determines to be appropriate.".

SEC. 5. CITIZEN'S GUIDE.

(a) SCHEDULE.—Section 304(a) of the Toxic Substances Control Act (as redesignated by section 4 of this Act) is amended—

(1) by striking "June 1, 1989," and inserting "January 1, 1995,"; and

(2) by inserting ", in consultation with the Director of the Centers for Disease Control of the Department of Health and Human Services," after "Administrator" in the last sentence of the subsection.

(b) ACTION LEVELS.—Section 304(b)(1) of the Toxic Substances Control Act (as redesignated by section 4 of this Act) is amended—

(1) by inserting "(A)" after "ACTION LEVELS.—"; and

(2) by adding at the end the following new subparagraphs:

"(B) The citizen's guide shall state the national goals established in this title, and shall estimate the average national ambient outdoor radon level. The guide shall also indicate the health benefits of reducing indoor radon levels to ambient outdoor levels.

"(C) The citizen's guide shall state and explain the target action point established pursuant to section 301(c).".

(c) INFORMATION.—Section 304(b)(2) of the Toxic Substances Control Act (as redesignated by section 4 of this Act) is amended by adding at the end the following new subparagraph:

"(F) The location of priority radon areas and the likelihood of radon levels above the target action point within and outside of priority radon areas.".

SEC. 6. MODEL CONSTRUCTION STANDARDS.

(a) TECHNICAL AMENDMENTS.—

(1) IN GENERAL.—Section 305 of the Toxic Substances Control Act (as redesignated by section 4 of this Act) is amended—

(A) by inserting "(a) STANDARDS.—" before the first sentence;

(B) by inserting "and periodically update" after "develop";

(C) by striking the second and fifth sentences of the section;

(D) by inserting the following new subsection after the first sentence:

"(b) CONSULTATION.—In developing and updating standards and techniques pursuant to subsection (a), the Administrator shall consult with—

"(1) the Secretary of Housing and Urban Development;

"(2) organizations that are involved in establishing national building construction standards and techniques; and

"(3) national organizations that represent homebuilders and State and local housing agencies (including public housing agencies).";

(E) by striking "The model standards" and inserting the following:

"(c) GEOGRAPHIC DIFFERENCES.—

"(1) IN GENERAL.—The model standards"; and

(F) by striking "The Administrator shall work to ensure" and inserting the following:

"(d) IMPLEMENTATION.—The Administrator shall work to ensure".

(2) SCHEDULE.—Section 305 of the Toxic Substances Control Act (as redesignated by section 4 of this Act, and as amended by paragraph (1)) is further amended by adding at the end the following new subsection:

"(e) SCHEDULE.—The Administrator shall publish final radon control standards and techniques for—

"(1) residential dwellings and make the techniques available to the public and the building industry by not later than 60 days after the date of enactment of this subsection; and

"(2) multiunit residential structures and schools by not later than January 1, 1995.".

(b) OBJECTIVES.—Section 305 of the Toxic Substances Control Act (as redesignated by section 4 of this Act, and as amended by subsection (a) of this section) is further amended by adding at the end of subsection (c) (as designated by subsection (a)(1)(E) of this section) the following new paragraph:

"(2) MODEL STANDARDS AND TECHNIQUES.—(A) The model standards and techniques shall—

"(i) indicate a range of effective radon control measures, practices, and techniques, that apply to original construction of a wide variety of building types, locations, conditions, and circumstances; and

"(ii) indicate the general range of radon control achievable by the measures, individually, and in combination with, other measures.

"(B)(i) At a minimum, the Administrator shall establish minimum radon reduction measures, practices, and techniques for new construction for the purpose of determining compliance with this section.

"(ii) The radon standards shall be designed—

"(I) to require the use of reasonably available and economically achievable techniques; and

"(II) where possible, to achieve indoor radon levels in homes that are less than the target action point established pursuant to section 304(b)(1)(C) by using the techniques referred to in subclause (I).".

(c) FEDERALLY ASSISTED HOUSING.—Section 305 of the Toxic Substances Control Act (as redesignated by section 4 of this Act, and as amended by subsection (b) of this section) is further amended by adding at the end the following new subsection:

"(f) FEDERALLY ASSISTED HOUSING.—The appropriate Federal official shall require that any residential dwelling or multiunit residential structure constructed—

"(1) later than 2 years after the date of the establishment of new construction standards pursuant to this section or the date of enactment of this section, whichever is later, in an area designated by the Administrator as a priority radon area; or

"(2) later than 2 years after the designation of an area as a priority radon area, whichever is later,

shall be constructed in accordance with the radon control standards established pursuant to subsection (c)(2)(B), before providing any direct Federal financial assistance.".

(d) DESIGN AWARDS AND CERTIFICATION.—Section 305 of the Toxic Substances Control Act (as redesignated by section 4 of this Act, and as amended by subsection (c) of this section) is further amended by adding at the end the following new subsection:

"(g) DESIGN AWARDS.—

"(1) IN GENERAL.—The Administrator shall establish a radon design awards program.

"(2) DESIGN AWARDS.—The radon design awards program shall provide for an award for the best residential design incorporating radon control or mitigation standards for each category of residential design that the Administrator shall determine.".

(e) RELATIONSHIP TO STATE AND LOCAL STANDARDS.—Section 305 of the Toxic Substances Control Act (as redesignated by section 4 of this Act, and as amended by subsection (d) of this section) is further amended by adding at the end the following new subsections:

"(h) RELATIONSHIP TO STATE AND LOCAL STANDARDS.—The standards published pursuant to this section shall not preempt the use of any State or local building standard if the State or local standard is equally effective in reducing radon levels as the standards published pursuant to this section.

"(i) CODE PROMOTION.—The Administrator shall develop a program to provide assistance to local governments, builders, national code organizations, national associations, States and other persons and entities that the Administrator determines to be appropriate to implement the adoption and use of radon-resistant building standards. The assistance may include educational and outreach materials and technical assistance.".

SEC. 7. TECHNICAL ASSISTANCE.

(a) ACTIVITIES.—Section 306(a) of the Toxic Substances Control Act (as redesignated by section 4 of this Act) is amended by adding at the end the following new paragraphs:

"(9) Development of a model State program to disseminate radon information to State and local tenant organizations.

"(10) Assistance to State agencies and other organizations concerning the assessment and mitigation of radon in public water supplies.

"(11) Assistance to State agencies and other organizations to facilitate prompt adoption and effective enforcement of new construction standards for reducing radon levels developed pursuant to section 305.

"(12) Development of—

"(A) testing guidelines for multiunit residential structures and multistory buildings not later than 6 months after the date of enactment of this paragraph; and

"(B) mitigation guidelines not later than 3 years after the date of enactment of this paragraph.

"(13) Issuance of guidance to States on appropriate elements of State radon measurement and mitigation proficiency programs.".

(b) PROFICIENCY TESTING.—(1) Section 306(a)(2) of the Toxic Substances Control Act (as redesignated by section 4 of this Act) is amended by striking "voluntary".

(2) Section 306(e) of the Toxic Substances Control Act (as redesignated by section 4 of this Act) is amended—

(A) in paragraph (2), by inserting "(A)" before "To cover the operating cost";

(B) by striking "No such charge may be imposed on any State or local government."; and

(C) by adding after paragraph (2)(A), as so redesignated, the following new subparagraphs:

"(B)(i) Except as otherwise provided in clause (ii), for the purposes of this paragraph, the term 'small business' means a corporation, partnership, or unincorporated business that—

"(I) has 150 or fewer employees; and

"(II) for the 3-year period preceding the date of the assessment, has an average annual gross revenue from radon measurement and mitigation activities in an amount that does not exceed $40,000,000.

"(ii) If, after consultation with the Small Business Administration, the Administrator determines that a modification of the definition of the term 'small business' under clause (i) is appropriate to characterize small businesses associated with radon measurement and mitigation, the Administrator shall, by regulation, modify the definition in such manner as the Administrator determines to be appropriate.

"(C) The Administrator shall consider reductions of such charges for small businesses pursuant to the Regulatory Flexibility Act (5 U.S.C. 601 et seq.).

"(D) No such change may be imposed on any State or local government. In the case of a State that administers a radon proficiency program pursuant to section 314(c), the State may impose charges consistent with any charges that would otherwise have been imposed by the Administrator. Any amounts collected by a State as charges under this paragraph may be used as part of the non-Federal share of any grant awarded pursuant to section 307.".

SEC. 8. GRANT ASSISTANCE.

(a) APPLICATION.—Section 307(b) of the Toxic Substances Control Act (as redesignated by section 4 of this Act) is amended by adding at the end the following new paragraph:

"(6) A description of the efforts of the State to develop a mandatory radon proficiency program that is consistent with sections 306(a)(2) and 314.".

(b) ELIGIBLE ACTIVITIES.—Section 307(c) of the Toxic Substances Control Act (as redesignated by section 4 of this Act) is amended by adding at the end the following new paragraphs:

"(11) Technical assistance to public water supply systems concerning the mitigation of radon in public water supplies, and public education and information activities to assist homeowners in the assessment and mitigation of radon in private drinking water supplies.

"(12) Activities to—

"(A) adopt model new construction standards for reducing radon levels developed pursuant to section 305 with respect to the State; and

"(B) ensure the implementation of the standards in the State.

"(13) Technical and financial assistance to nonprofit public interest groups to encourage radon testing and mitigation at local levels.

"(14) Targeting outreach and technical assistance activities to licensed child care facilities in priority radon areas.

"(15) Notwithstanding the limitation in subsection (i)(4), payment, in the form of grants or loans, of the cost of implementing remediation measures necessary to prevent, in school buildings, levels of radon above the target action point identified pursuant to section 304(b)(1)(C) if the payments are made in consideration of the financial need of the applicant.

"(16) Payment of the costs of conducting radon tests required pursuant to section 308(d) if the payments are made in consideration of the financial need of the applicant.

"(17) Educational programs, for members of the housing industry, concerning the model construction standards and techniques published pursuant to section 305.

"(18) Financial assistance to conduct surveys to improve the precision of priority radon areas.".

(c) PREFERENCE TO CERTAIN STATES.—Section 307(d) of the Toxic Substances Control Act (as redesignated by section 4 of this Act) is amended—

(1) by striking "1991" and inserting "1994"; and

(2) by inserting before the period ", or have adopted equally effective standards".

(d) FEDERAL SHARE.—Section 307(f) of the Toxic Substances Control Act (as redesignated by section 4 of this Act) is amended by striking "in the third year" and inserting "in each succeeding year".

(e) ASSISTANCE TO LOCAL GOVERNMENTS.—Section 307(g) of the Toxic Substances Control Act (as redesignated by section 4 of this Act) is amended—

(1) by striking "and (6)" and inserting "(6), (11), (12), (14), (15), and (16),"; and

(2) by inserting “(1)” after “GOVERNMENTS.—”; and

(3) by adding at the end the following new paragraph:

“(2) Any remediation plan for reducing radon in school buildings implemented pursuant to this section shall be reviewed for consistency with Environmental Protection Agency guidance by the school official responsible for authorizing the types of structural changes referred to in the plan.”.

(f) INFORMATION.—Section 307(h) of the Toxic Substances Control Act (as redesignated by section 4 of this Act) is amended by adding at the end the following new paragraph:

“(4) Any State that receives funds under this section shall investigate consumer complaints concerning radon services that violate the radon proficiency program of the Environmental Protection Agency or the State. An appropriate official of the State shall advise the Administrator concerning any person who violates the requirements of section 314.”.

(g) AUTHORIZATION.—Section 307(j) of the Toxic Substances Control Act (as redesignated by section 4 of this Act) is amended by striking paragraph (5).

SEC. 9. RADON IN SCHOOLS.

Section 308 of the Toxic Substances Control Act (as redesignated by section 4 of this Act) is amended by adding at the end the following new subsections:

"(c) GUIDELINES.—

"(1) IN GENERAL.—Not later than 1 year after the date of enactment of this subsection, the Administrator shall publish guidelines on testing for and remediating radon in school buildings.

"(2) REQUIREMENTS AFTER PUBLICATION OF GUIDELINES.—After the publication of the guidelines pursuant to this subsection, any testing or remediation carried out pursuant to this section shall be conducted in a manner consistent with the guidelines.

"(3) INTERIM GUIDELINES.—Any radon testing or remediation of school buildings conducted prior to the publication of guidelines pursuant to this subsection shall be considered to meet the requirements of this section if the testing or remediation is conducted in a manner consistent with any interim guidance published by the Administrator or by a State (in any case where the Administrator determines that the guidelines of the interim guidance are substantially consistent with the guidelines published under this subsection).

"(d) REQUIREMENT FOR RADON TESTING.—

"(1) IN GENERAL.—Not later than 2 years after the designation by the Administrator of an area as a priority radon area, each local educational agency located in whole or in part in the designated area shall conduct tests for radon in each school building owned or operated by the local educational agency.

"(2) EXTENSION.—The Administrator may extend the schedule for testing for radon pursuant to this subsection to the date that is 2 years after the date of publication of testing guidelines pursuant to subsection (c).

"(3) TEST RESULTS.—

"(A) IN GENERAL.—The results of any tests conducted pursuant to this section by a local educational agency shall be available for public review in the administrative offices of the local educational agency during normal business hours.

"(B) NOTIFICATION.—The local educational agency shall—

"(i) notify parent, teacher, and employee organizations of the results; and "(ii) send the results to the Administrator and the agency of the State that implements radon programs.

"(4) SUPERVISION OF RADON TESTING.—Any radon testing conducted pursuant to this section shall be supervised by a person who has received instruction pursuant to a program of the Environmental Protection Agency or an equivalent State-approved program, as determined by the Administrator, and shall use radon measurement devices and methods approved by the radon proficiency program established pursuant to sections 306(a)(2) and 314.".

SEC. 10. REGIONAL RADON TRAINING CENTERS.

Section 309(b) of the Toxic Substances Control Act (as redesignated by section 4 of this Act) is amended by adding at the end the following new sentence: "The regional radon training centers are authorized to provide training to State and local building code officials, contractors, and other persons or entities of the building community, on the model construction standards and techniques published pursuant to section 305.".

SEC. 11. FEDERAL BUILDINGS.

Section 310 of the Toxic Substances Control Act (as redesignated by section 4 of this Act) is amended by adding at the end the following new subsection:

"(g) RADON ASSESSMENT AND MITIGATION PLAN.—(1) Not later than January 1, 1994, the Administrator shall submit to Congress a plan describing activities to be undertaken by appropriate Federal agencies to assess and mitigate radon in Federal buildings.

"(2) The Administrator shall consult with the heads of affected Federal agencies in the development of the plan required under this subsection.

"(3) The plan required under this subsection shall, at a minimum—

"(A) include a list of each Federal building and an indication of the results of any radon tests for the buildings conducted by the date of issuance of the plan;

"(B) specify the Federal buildings for which assessment and mitigation will be undertaken on an expedited basis on the basis of a consideration of—

"(i) the radon levels in the buildings;

"(ii) the number of people exposed to high radon levels; and

"(iii) the susceptibility of the building to mitigation;

"(C) specify the schedule for mitigation for each Federal building in which radon levels exceed the target action level specified in section 303(b)(1)(C); and

"(D) specify the Federal agency responsible for the building, the estimated cost of mitigation, and the source of funds for assessment and mitigation actions.

"(4) At a minimum, the head of each Federal agency that is responsible for Federal buildings shall ensure that—

"(A) all schools and residences that are Federal buildings are assessed to determine radon levels by not later than January 1, 1996;

"(B) all other Federal buildings are assessed to determine radon levels by not later than January 1, 1998; and

"(C) in the case of a Federal building with a radon level above the target action point established by the Administrator pursuant to section 304(b)(1)(C), measures designed to achieve radon levels at or below the target action point shall be implemented by not later than 2 years after the applicable deadline for assessment specified in this paragraph.

"(5) In implementing radon assessment and mitigation activities, the head of a Federal agency shall employ as a contractor a private firm certified by the Administrator as proficient pursuant to section 306(a)(2).

"(6) Not later than 2 years after the submittal of the plan required under this subsection, the Administrator shall submit to Congress a report on actions taken to implement the plan.".

SEC. 12. RADON INFORMATION.

Title III of the Toxic Substances Control Act (15 U.S.C. 2661 et seq.) (as amended by section 4 of this Act) is further amended by adding at the end the following new section:

"SEC. 313. DISCLOSURE OF INFORMATION CONCERNING RADON UPON TRANSFER OF RESIDENTIAL PROPERTY.

"(a) RADON DISCLOSURE IN PURCHASE AND SALE OR LEASE OF HOUSING.—

"(1) RADON HAZARDS.—Not later than 2 years after the date of enactment of this section, the Administrator and the Secretary of Housing and Urban Development shall promulgate regulations for the disclosure of radon hazards in housing that is offered for sale or lease. The regulations shall require that, before a purchaser or lessee is obligated under any contract to purchase or lease the housing, the seller or lessor shall—

"(A) provide the purchaser or lessee with a radon information pamphlet that meets the requirements of paragraph (2);

"(B) disclose to the purchaser or lessee the presence or level of any known radon in the housing and provide to the purchaser or lessee any radon evaluation report available to the seller or lessor; and

"(C) permit a purchaser to have a 10-day period before becoming obligated (unless the parties mutually agree upon a different period of time) to conduct a test to determine the level of radon in the housing.

"(2) RADON INFORMATION PAMPHLET.—

"(A) IN GENERAL.—Not later than 18 months after the date of enactment of this section, the Administrator, in consultation with the Secretary of Housing and Urban Development, representatives of national organizations that represent State and local housing agencies (including public housing agencies), real estate groups, citizen groups and other groups that the Administrator determines to be appropriate, shall develop a written document containing radon-related information.

"(B) CONTENTS OF DOCUMENT.—The document shall include, at a minimum—

"(i) information indicating the health risk associated with different levels of radon exposure consistent with the health information in the citizen's guide under section 304;

"(ii) information regarding the advisability of undertaking measures to mitigate dangerous levels of radon;

"(iii) information regarding appropriate Federal agencies and departments and agencies of States and that can provide further information on the health risk from radon, and a list of firms or other entities approved by the Administrator for the purposes of radon detection and mitigation; and

"(iv) recommended Environmental Protection Agency radon testing procedures that will provide quality and reliable measurements in conjunction with a real estate transaction.

"(3) CONTRACT FOR PURCHASE AND SALE.—The regulations promulgated under this section shall provide that each contract for the purchase and sale of any interest in housing shall contain a Radon Warning Statement and a statement signed by the purchaser that the purchaser has—

"(A) read the Radon Warning Statement and understands the contents of the statement;

"(B) received a radon hazard information pamphlet; and

"(C) had an opportunity to conduct a test to determine the level of radon in the housing within the period specified in paragraph (1)(C) or a period agreed on pursuant to paragraph (1)(C).

"(4) CONTENTS OF RADON WARNING STATEMENT.—The Radon Warning Statement shall contain the following text printed in large type on a separate sheet of paper attached to the contract:

" 'Every purchaser of any interest in residential real property is notified that the property may present exposure to levels of radon gas that may cause lung cancer. The seller of any interest in residential real property is required to provide the buyer with any information on the levels of radon in the housing in the possession of the seller. A radon test is recommended prior to purchase.'

"(5) COMPLIANCE ASSURANCE.—In any case in which a seller or lessor has entered into a contract with an agent for the purpose of selling or leasing a unit of housing, the regulations promulgated under this section shall require the agent, on behalf of the seller or lessor, to ensure compliance with the requirements of this section.

"(6) PROMULGATION.—A suit may be brought against the Administrator or the Secretary of Housing and Urban Development under section 321 to compel the promulgation of the regulations required under this section. The Federal district court shall have jurisdiction to order the promulgation of the regulations.

"(b) CIVIL LIABILITY.—

"(1) IN GENERAL.—Any person who knowingly violates any provision of this section shall be jointly and severally liable to a mortgage applicant, purchaser, or lessee in an amount equal to 3 times the amount of damages incurred by the individual.

"(2) COURT COSTS AND ATTORNEY FEES.—In any civil action brought for damages under this subsection, the appropriate court may award court costs to the party that commences the action, together with reasonable attorney fees and any expert witness fees, in any case in which the party prevails.

"(c) VALIDITY OF CONTRACTS AND LIENS.—Nothing in this section shall—

"(1) affect the validity or enforceability of any sale or contract for the purchase and sale or lease of any interest in residential real property or any loan, loan agreement, mortgage, or lien made or arising in connection with a mortgage loan; or

"(2) create a defect in title.

"(d) EFFECTIVE DATE.—The regulations under this section shall take effect on the date that is 3 years after the date of the enactment of this section.".

SEC. 13. MANDATORY RADON PROFICIENCY PROGRAM.

Title III of the Toxic Substances Control Act (15 U.S.C. 2661 et seq.) (as amended by section 12 of this Act) is further amended by adding at the end the following new section:

"SEC. 314. MANDATORY RADON PROFICIENCY PROGRAM.

"(a) MANDATORY PARTICIPATION.—Beginning on the date that is 2 years after the date of the enactment of this section, no person shall offer radon measurement devices or radon measurement or mitigation services to the public unless such person has successfully completed the radon proficiency program of the Environmental Protection Agency, or appropriate portions of the program.

"(b) STATUTORY CONSTRUCTION.—Nothing in this section shall be construed to apply to governmental units or nonprofit organizations that provide a radon service for their own use and do not provide that service for commercial purposes.

"(c) DELEGATION TO STATES.—

"(1) IN GENERAL.—The Administrator shall administer the mandatory proficiency program under this section in a manner consistent with the Guidance to States on Radon Certification of the Environmental Protection Agency.

"(2) AGREEMENT.—The Administrator is authorized to enter into any agreement or other arrangement with any State for the purpose of delegating the radon proficiency program of the Environmental Protection Agency, including enforcement provisions, or any other part of the program, to the State, if the State program is consistent with the Federal program.

"(d) PROHIBITED ACTS.—It shall be unlawful for any person to—

"(1) fail or refuse to comply with this section (including any rule or regulation promulgated under this section or order issued pursuant to this section); or

"(2) fail or refuse to—

"(A) establish or maintain records as required by the Administrator or by a State with respect to which the Administrator has entered into an agreement or other arrangement under subsection (c);

"(B) submit any report, notice, or other information, required to be submitted by the Administrator or by the appropriate official of a State the Administrator has entered into an agreement or other arrangement under subsection (c);

"(C) permit entry or inspection by the Administrator, or by the appropriate official of a State with respect to which the Administrator has entered into an agreement or other arrangement under subsection (c); or

"(D) permit access to, or copying of, records by the appropriate official of a State with respect to which the Administrator has entered into an agreement or other arrangement under subsection (c).".

SEC. 14. MEDICAL COMMUNITY OUTREACH.

Title III of the Toxic Substances Control Act (15 U.S.C. 2661 et seq.) (as amended by section 13 of this Act) is further amended by adding at the end the following new section:

"SEC. 315. MEDICAL COMMUNITY OUTREACH.

"(a) IN GENERAL.—The Administrator, in cooperation with the Secretary of Health and Human Services, shall develop and implement an outreach program to provide information concerning radon to the medical community.

"(b) INFORMATION.—

"(1) IN GENERAL.—The Administrator, in consultation with the Secretary of Health and Human Services, the Surgeon General, and the Director of the Centers for Disease Control, shall develop informational material concerning radon tailored to physicians in general practice and in specialties related to lung cancer. The information shall, at a minimum—

"(A) explain the health threats posed by exposure to radon and include a summary of scientific evidence that demonstrates the human health effects of exposure to radon;

"(B) explain the association of radon with smoking and other causes of lung cancer;

"(C) identify appropriate steps to take to determine exposure to radon in the home; and

"(D) identify sources of additional information.

"(2) TRANSMITTAL OF INFORMATION.—Not later than 1 year after the date of enactment of this section, the Administrator shall transmit the information developed pursuant to this section to—

"(A) physicians in general practice;

"(B) physicians in specialties related to lung cancer;

"(C) all physicians employed by the Federal Government;

"(D) all hospital administrators; and

"(E) other physicians and officials determined by the Administrator to be appropriate.

"(c) REPORT.—Not later than 2 years after the date of enactment of this section, the Administrator, in consultation with the Secretary of Health and Human Services, shall report to Congress concerning—

"(1) the implementation of this section; and

"(2) recommendations for measures to improve radon information dissemination to the medical community.".

SEC. 15. FEDERAL HOUSING.

Title III of the Toxic Substances Control Act (15 U.S.C. 2661 et seq.) (as amended by section 14 of this Act) is further amended by adding at the end the following new section:

"SEC. 316. FEDERALLY OWNED AND ASSISTED HOMES, SCHOOLS, AND BUILDINGS.

"(a) FEDERALLY FUNDED CONSTRUCTION.—Not later than 6 months after the publication of priority radon areas required by section 303, or the publication of model construction standards required by section 305, whichever is later, the head of each Federal agency shall adopt such procedures as may be necessary to ensure that any new Federal building, or any school constructed with Federal financial assistance, in a priority radon area shall conform to the model construction standards required by section 305.

"(b) FEDERALLY ASSISTED HOUSING.—The Secretary of Housing and Urban Development, in cooperation with the Administrator, shall, not later than 1 year after the date of enactment of this section, disseminate in priority radon areas information concerning the health threats posed by radon, proper methods of testing for radon, and techniques for mitigating elevated radon levels to public housing agencies and Indian housing authorities, as defined in paragraphs (6) and (11), respectively, of section

3(b) of the United States Housing Act of 1937 (42 U.S.C. 1437a(b)), and to owners and managers of other housing assisted under other provisions of the United States Housing Act of 1937 (42 U.S.C. 1437 et seq.) and the National Housing Act (12 U.S.C. 1701 et seq.).

"(c) RESEARCH.—The Secretary of Housing and Urban Development shall undertake a program of radon research, consisting of research concerning—

"(1) radon distribution and mitigation within multiunit residential structures in conjunction with the Administrator;

"(2) landlord liability;

"(3) predicting radon hazards in new multiunit residential structures on particular lands; and

"(4) such other research as both the Secretary of Housing and Urban Development and the Administrator consider appropriate.

"(d) TESTING REQUIREMENT.—

"(1) IN GENERAL.—Beginning on the date that is 6 months after the date of publication of Radon Priority Areas required by this title, any federally owned housing in a Radon Priority Area shall be tested for radon before a sales contract to sell the home is signed.

"(2) REQUIREMENTS FOR RADON TESTING.—Any radon testing conducted pursuant to this section shall—

"(A) be supervised by a person who has received instruction pursuant to a program of the Environmental Protection Agency or equivalent State approved program, as determined by the Administrator; and

"(B) use radon measurement devices and methods approved by the radon proficiency program established pursuant to section 306(a)(2).

"(3) SATISFACTION OF REQUIREMENTS BY CERTAIN DEPARTMENTS AND AGENCIES.—Radon testing conducted within a 5-year period prior to acquisition by a Federal department or agency, or any Government corporation or Government-controlled corporation, shall be considered to satisfy the requirements of this section if the test otherwise meets the requirements of paragraph (2).

"(4) AVAILABILITY OF RESULTS.—The results of a radon test required pursuant to this section shall be made available to potential buyers of any homes described in paragraph (1) before a sales contract to sell the home is signed.

"(5) TREATMENT AS MODIFICATIONS.—To the extent that this subsection increases the costs of the Federal Government of outstanding direct loan obligations or loan guaranty commitments, the activities shall be treated as modifications under section 504(e) of the Federal Credit Reform Act of 1990 (2 U.S.C. 661c(e)) and shall be subject to the availability of appropriations. To the extent that this subsection imposes additional costs to the Resolution Trust Corporation and the Federal Deposit Insurance Corporation, the requirements of this subsection shall be carried out only if appropriations are provided in advance in an appropriations Act. In the absence of appropriations sufficient to cover the costs of this subsection, the requirements shall not apply to any agency affected by the requirements.".

SEC. 16. NATIONAL RADON EDUCATIONAL EFFORTS.

Title III of the Toxic Substances Control Act (15 U.S.C. 2661 et seq.) (as amended by section 15 of this Act) is further amended by adding at the end the following new section:

"SEC. 317. NATIONAL RADON EDUCATIONAL CAMPAIGN.

"The Administrator shall establish a national education campaign to increase public awareness concerning radon health risks and motivate public action to reduce radon levels. The national education campaign shall include the use of funds for the purchase and production of public educational materials. The Administrator is authorized to enter into cooperative agreements to carry out this section.".

SEC. 17. RADON IN WORK PLACES.

Title III of the Toxic Substances Control Act (15 U.S.C. 2661 et seq.) (as amended by section 16 of this Act) is further amended by adding at the end the following new section:

"SEC. 318. RADON IN WORK PLACES.

"(a) STUDY OF RADON IN WORK PLACES.—

"(1) AUTHORITY.—The Director of the National Institute for Occupational Safety and Health of the Department of Health and Human Services, in consultation with the Administrator, shall conduct a study for the purpose of determining the extent of radon contamination in the work places of the United States.

"(2) SURVEY.—In conducting the study, the Director of the National Institute for Occupational Safety and Health of the Department of Health and Human Services and the Administrator shall be jointly responsible for designing a survey that, on completion, shall allow Congress to characterize the extent of radon contamination in work places. The survey shall include testing from a representative sample of work places in each priority radon area and shall include additional testing, to the extent resources are available for the testing.

"(3) REPORT.—Not later than 2 years after the date of enactment of this section, the Director of the National Institute for Occupational Safety and Health of the Department of Health and Human Services, in consultation with the Administrator, shall submit to Congress a report that describes the results of the study conducted pursuant to this section.

"(b) AUTHORIZATION.—There are authorized to be appropriated such sums as may be necessary to carry out this section, but not to exceed $2,000,000.".

SEC. 18. PREEMPTION.

Title III of the Toxic Substances Control Act (15 U.S.C. 2661 et seq.) (as amended by section 17 of this Act) is further amended by adding at the end the following new section:

"SEC. 319. PREEMPTION.

"(a) CONSTRUCTION OF PROVISIONS AS NOT PREEMPTING OTHER LAWS.—Nothing in this title shall be construed, interpreted, or applied to preempt, displace, or supplant any other Federal or State law, whether statutory or common.

"(b) AWARD OF COSTS AND DAMAGE AWARDS.—Nothing in this title shall be construed or interpreted to preclude any court from awarding costs and damages associated with the testing or mitigation of radon contamination, or a portion of such costs, at any time.

"(c) CONSTRUCTION OF PROVISIONS AS NOT PROHIBITING MORE STRINGENT STATE REQUIREMENTS.—Nothing in this title shall be construed or interpreted as preempting a State, with respect to radon within the State, from establishing any liability or more stringent requirement that is equal to or, more stringent than, a requirement under this title.

"(d) CREATION OF CAUSE OF ACTION.—Nothing in this title shall create a cause of action, or in any other way increase or diminish the liability of any person under any other law.

"(e) EFFECT OF PROVISIONS IN CIVIL ACTIONS FOR DAMAGES.—

"(1) IN GENERAL.—It is not the intent of Congress that this section, or any rule, regulation, or orders issued pursuant to this section, shall be interpreted as influencing, in either the favor of a plaintiff or defendant, the disposition of any civil action for damages relating to radon.

"(2) STATUTORY CONSTRUCTION.—This shall not affect the authority of any court to make a determination in any adjudicatory proceeding under applicable State law with respect to the admission into evidence or any other application of this title or rules, regulations, or orders issued pursuant to this title.".

SEC. 19. ENFORCEMENT.

Title III of the Toxic Substances Control Act (15 U.S.C. 2661 et seq.) (as amended by section 18 of this Act) is further amended by adding at the end the following new section:

"SEC. 320. ENFORCEMENT.

"(a) CIVIL PENALTIES.—

"(1) IN GENERAL.—Any person who violates section 313 or 314, or who provides false information concerning compliance with section 305(f) to an appropriate Federal official, shall be liable to the United States for a civil penalty in an amount not to exceed $10,000 for each violation.

"(2) CIVIL PENALTIES.—

"(A) IN GENERAL.—A civil penalty under this section shall be assessed by the Administrator by an order made on the record after opportunity for a hearing in accordance with section 554 of title 5, United States Code. Before issuing the order, the Administrator shall give written notice to the person to be assessed a civil penalty under the order and provide such person an opportunity to request a hearing on the order not later than 15 days after the date the notice is received by the person.

"(B) DETERMINATION OF AMOUNT OF CIVIL PENALTY.—In determining the amount of a civil penalty, the Administrator may take into account—

"(i) the nature, circumstances, extent, and gravity of each violation; and

"(ii) with respect to the violator, the ability to pay, the effect on ability to continue to do business, any history of prior such violations, the degree of culpability, and such other matters as justice may require.

"(C) NOTIFICATION OF CIVIL PENALTIES.—The Administrator may compromise, modify, remit, with or without conditions, any civil penalty that may be imposed under this subsection. The amount of the penalty, when finally determined, or the amount agreed upon in compromise, may be deducted from any sums owing by the United States to the firm charged.

"(3) JUDICIAL REVIEW.—Any person who—

"(A) has requested a hearing under this section concerning the assessment of a civil penalty; and

"(B) is aggrieved by an order assessing a civil penalty,

may file a petition for judicial review of such order with the United States Court of Appeals for the District of Columbia Circuit or for any other circuit in which such person resides or transacts business. The petition may only be filed within the 30-day period beginning on the date the order making the assessment is issued.

"(4) FAILURE TO PAY ASSESSMENT.—If any person fails to pay an assessment of a civil penalty—

"(A) after the order making the assessment has become a final order (if such person does not file a petition for judicial review of the order in accordance with paragraph (3)); or

"(B) after a court, in an action brought under paragraph (3), has entered a final judgment in favor of the Administrator,

the Attorney General shall recover the amount assessed (plus interest at currently prevailing rates from the date of the expiration of the 30-day period referred to in paragraph (3) or the date of the final judgment, as the case may be) in an action brought in any appropriate district court of the United States. In such an action, the validity, amount, and appropriateness of such penalty shall not be subject to review.

"(b) COMPLIANCE ORDERS.—

"(1) IN GENERAL.—If the Administrator finds on the basis of information made available, that a person, firm, or organization is in violation of this title, the Administrator shall proceed under the authority under paragraph (2), or notify the person, firm, or organization in which the violation occurred. If, after a 30-day period beginning on the date of notification by the Administrator, the State has not commenced appropriate enforcement action, the Administrator may issue an order requiring compliance or such other relief as the Administrator may find appropriate, or bring a civil action in accordance with paragraph (4).

"(2) ENFORCEMENT.—If the Administrator finds, on the basis of information made available, that a person, firm, or organization is in violation of a requirement of this title, the Administrator may issue an order requiring such person, firm, or organization to comply with the requirement or such other relief as the Administrator may find appropriate, or shall bring a civil action in accordance with paragraph (4).

"(3) ORDERS.—

"(A) IN GENERAL.—Any orders issued under this section shall—

"(i) be by personal service;

"(ii) state with reasonable specificity the nature of the violation; and

"(iii) specify a period for compliance of not to exceed 30 days.

"(B) ORDERS.—In issuing each order the Administrator shall take into account the seriousness of the violation and any good faith efforts to comply with applicable requirements.

"(4) CIVIL ACTION.—

"(A) In general.—The Administrator is authorized to commence a civil action for appropriate relief, including a permanent or temporary injunction, of any violation for which the Administrator is authorized to issue a compliance order under paragraph (1).

"(B) Venue.—Any action taken under this subsection may be brought in the district court of the United States in the district in which the defendant is located or resides or is doing business. The court shall have jurisdiction to restrain the violation and require compliance. Notice of the commencement of the action shall be given immediately on commencement to the appropriate State.".

SEC. 20. CITIZEN SUITS.

Title III of the Toxic Substances Control Act (15 U.S.C. 2661 et seq.) (as amended by section 19 of this Act) is further amended by adding at the end the following new section:

"SEC. 321. CITIZEN SUITS.

"(a) In General.—

"(1) In general.—Except as provided in subsection (b), any person may commence a civil action—

"(A) against the United States in any case in which the United States is alleged to be in violation of section 305(f), 310, or 316, or any rule promulgated thereunder, to restrain the violation;

"(B) against any person who is alleged to be in violation of section 308, 313, or 314, or any rule promulgated thereunder, to restrain the violation; or

"(C) against the Administrator to compel the Administrator to perform any act or duty under this title that is not discretionary.

"(2) ACTIONS.—

"(A) IN GENERAL.—Each civil action under paragraph (1)(A) shall be brought in the United States district court for the district in which the alleged violation occurred, in which the defendant resides, or in which the principal place of business of the defendant is located. Any action brought under paragraph (1)(B) shall be brought in the United States District Court for the District of Columbia, or the United States district court for the judicial district in which the plaintiff is domiciled.

"(B) JURISDICTION.—The district courts of the United States shall have jurisdiction over suits brought under this section, without regard to the amount in controversy or the citizenship of any party.

"(C) SERVICE OF PROCESS.—In any civil action under this subsection, process may be served on a defendant in any judicial district in which the defendant resides or may be found. Subpoenas for witnesses may be served in any judicial district.

"(b) LIMITATION.—

"(1) IN GENERAL.—No civil action may be commenced—

"(A) under subsection (a)(1)(A) to restrain a violation of this title, or rule or order under this title—

"(i) before the expiration of the 60-day period beginning on the date that the plaintiff gives notice of the violation—

"(I) to the Administrator; and

"(II) to the person who is alleged to have committed the violation; or

"(ii) if—

"(I)(aa) the Administrator has commenced, and is diligently prosecuting, a proceeding to require compliance with this title or with a rule or order issued under this title; or

"(bb) the Attorney General has commenced and is diligently prosecuting a civil action in a court of the United States to require compliance with this title or with a rule or order issued under this title; and

"(II) the proceeding or civil action is commenced after the giving of notice; or

"(B) under subsection (a)(1)(B) before the expiration of the 60-day period beginning on the date that the plaintiff gives notice to the Administrator of the alleged failure of the Administrator to perform an act or duty that is the basis for such action.

"(2) NOTICE.—Notice under this subsection shall be given in such manner as the Administrator shall prescribe by rule. Any person who pursuant to paragraph (1)(A) may intervene as a matter of right in the proceeding or action.

"(c) IN GENERAL.—

"(1) INTERVENTION BY ADMINISTRATOR.—In any action under this section, the Administrator, if not a party, may intervene as a matter of right.

"(2) COURT COSTS.—The court, in issuing any final order in any action brought pursuant to subsection (a), may award costs of suit and reasonable fees for attorneys and expert witnesses if the court determines that the award is appropriate. In issuing a decision in an action brought to review such an order, the court may award costs of suit and reasonable fees for attorneys if the court determines that the award is appropriate.

"(3) STATUTORY CONSTRUCTION.—Nothing in this section shall restrict any right that any person (or class of persons) may have under any statute or common law to seek enforcement of this Act, or any rule or order under this Act, or to seek any other relief.

"(d) CONSOLIDATION.—

"(1) IN GENERAL.—If 2 or more civil actions brought under subsection (a) involve the same defendant and the same issues or violations are pending in 2 or more judicial districts, the pending actions, upon an application of the defendants to the actions is made to a court in which any of the actions is brought, may, if the court in the discretion of the court so decides, be consolidated for trial by order (issued after giving all parties reasonable notice and opportunity to be heard) of the court and tried in—

"(A) a district that is selected by the defendant and in which 1 of the actions is pending;

"(B) a district that is agreed upon by stipulation between all the parties to the actions and in which 1 of the actions is pending; or

"(C) a district that is selected by the court and in which 1 of the actions is pending.

"(2) NOTIFICATION.—In issuing an order referred to in paragraph (1), the Court shall give prompt notification of the order to the other courts in which the civil actions consolidated under the order are pending.".

SEC. 21. AUTHORIZATIONS OF APPROPRIATIONS.

(a) TECHNICAL ASSISTANCE.—Section 306(f) of the Toxic Substances Control Act (as redesignated by section 4 of this Act) is amended by striking "and 1991." and inserting "1991, 1992, 1993, 1994, 1995, and 1996.".

(b) GRANT ASSISTANCE.—Section 307(j)(1) of the Toxic Substances Control Act (as redesignated by section 4 of this Act) is amended by inserting before the period ", and $15,000,000 for each of fiscal years 1992, 1993, 1994, 1995, and 1996.".

(c) SCHOOL REMEDIATION.—Section 307(j) of the Toxic Substances Control Act (as redesignated by section 4 of this Act) is amended—

(1) by striking paragraph (5); and

(2) by adding at the end the following new paragraphs:

"(5) Of funds appropriated pursuant to this subsection for fiscal years 1994 through 1996, not more than one-third shall be used to implement radon remediation measures for local educational agencies pursuant to paragraphs (15) and (16) of subsection (c).

"(6) Of funds appropriated pursuant to this subsection for fiscal years 1994 through 1996, the Administrator may reserve an amount up to 2 percent or $200,000, whichever is the greater, for the purposes of making grants to local educational agencies for the implementation of measures to reduce radon levels—

"(A) local educational agency is prohibited by State law from receiving grant assistance from the State; and

"(B) the local educational agency provides not less than 50 percent of the cost of implementing such measures from non-Federal sources.".

(d) REGIONAL TRAINING CENTERS.—Section 309(f) of the Toxic Substances Control Act (as redesignated by section 4 of this Act) is amended by inserting before the period ", and $1,500,000 for each of fiscal years 1992, 1993, 1994, 1995, and 1996.".

SEC. 22. TECHNICAL AMENDMENTS.

(a) TABLE OF CONTENTS.—The table of contents in section 1 of the Toxic Substances Control Act (15 U.S.C. 2601 note) is amended—

(1) by redesignating the items relating to sections 303 through 311 as 304 through 312, respectively;

(2) by inserting after the item relating to section 302 the following new item:

"Sec. 303. Priority radon areas.";

and

(3) by adding at the end the following new items:

"Sec. 313. Radon-related information.

"Sec. 314. Mandatory radon proficiency program.
"Sec. 315. Medical community outreach.
"Sec. 316. Federally owned and assisted homes, schools, and buildings.
"Sec. 317. National radon educational campaign.
"Sec. 318. Radon in work places.
"Sec. 319. Preemption.
"Sec. 320. Enforcement.
"Sec. 321. Citizens suits.
"Sec. 322. Periodic reassessment of health risks.".

(b) RADON MITIGATION DEMONSTRATION PROGRAM.—Section 118(k)(2) of the Superfund Amendments and Reauthorization Act of 1986 (42 U.S.C. 7401 note) is amended—

(1) in subparagraph (A)—

(A) by inserting "develop and" before "test methods"; and

(B) by adding at the end of the subparagraph the following new sentence: "The demonstration program shall include the development and evaluation of innovative low-cost techniques to reduce radon concentrations in existing structure (in existence at the time of the program), including structures with low to moderate radon levels, and in new structures, and the development and demonstration of radon mitigation technology for multistory buildings.".

(2) by striking subparagraph (B); and

(3) by redesignating subparagraph (C) as subparagraph (B).

SEC. 23. REPORT TO CONGRESS ON PROMOTING RADON TESTING.

(a) EVALUATION.—The Administrator of the Environmental Protection Agency, in consultation with the Secretary of Housing and Urban Development, the Secretary of Agriculture, and the Secretary of Veterans Affairs, shall evaluate existing (in existence at the time of the evaluation) efforts to promote radon testing in the homes of the United States and methods to increase radon testing.

(b) REPORT.—

(1) IN GENERAL.—The Administer shall report to Congress by October 1, 1994, on the effectiveness of alternative strategies to promote radon testing. The strategies shall include—

(A) grants to support the development of radon testing strategies by States;

(B) financial incentives to homeowners;

(C) testing and disclosure of radon levels during real estate marketing;

(D) public education programs;

(E) distributing radon information during real estate marketing; and

(F) distributing radon information with utility bills.

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(2) CONSULTATION.—In preparing the report, the Administrator shall consult with concerned parties, including public interest groups, health officials, radon testing industries, realtors, home builders, utilities and the States.

SEC. 24. PERIODIC REASSESSMENT OF HEALTH RISKS.

Title III of the Toxic Substances Control Act (15 U.S.C. 2661 et seq.) is amended by adding at the end thereof the following new section:

"SEC. 322. PERIODIC REASSESSMENT OF HEALTH RISKS.

The Administrator, in consultation with the heads of the National Academy of Sciences and the Centers for Disease Control, shall conduct a program to reassess, on a periodic basis, the human health risks associated with radon exposure.".

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